



SATURDAY, FEBRUARY 24, 1872.

Single-Rail Railroads.

We cut the following description of a proposed plan for a quick-transit railroad from the *New York Tribune* of February 16:

"The drawings and model of a new elevated railway, for quick transit, were exhibited yesterday to a number of persons at Gilsey's Building, Broadway and Cortlandt street. The plan of this railway is as follows: Rolled wrought-iron posts are set immovably twenty-five feet apart, and a single rail is laid along the tops, eighteen feet above the surface of the street. It is proposed to sink the posts between the car tracks on Third or Fourth avenue, or along Broadway from the City Hall over Harlem Bridge to Fordham. Along this single track the cars will be run on two wheels placed in line with each other, and from each side of the car there will depend two braces having horizontal wheels at their lower extremities. These wheels, when the car is in motion, will revolve on corresponding rails placed along the sides of the posts, and in connection with the braces will tend to prevent that oscillation which is apt to occur when cars are in rapid motion, thereby rendering it also extremely difficult for them to be thrown from the track.

"To supply motive power, it is proposed to have reservoirs of compressed air, which are to be continually replenished with pumps placed at both ends of the road, and tubes connecting therewith to extend along the line of the rails, so that at intervals of every fourth mile other reservoirs attached to the bottom of the cars may be replenished with the air conveyed through the tubes. The reservoirs on the cars will be thirty feet long and three feet in diameter, and will be made to withstand a pressure of 100 pounds to the square inch. It is estimated that the quantity of compressed air which these reservoirs will contain will be sufficient, operating through their separate engines, to draw a train of six cars from the City Hall to Harlem Bridge without requiring to be replenished. This calculation is based on work performed by this agent at the Mont Cenis and Hoosac tunnels. It is claimed that the weight of the engine, which it is proposed to place beneath the body of the smoking cars, will tend to secure steadiness of motion. The seats, which are placed in the center of the cars and arranged to have the passengers sit back to back, will also tend to concentrate the weight directly over the upright posts and girders and diminish thereby the chances of accident.

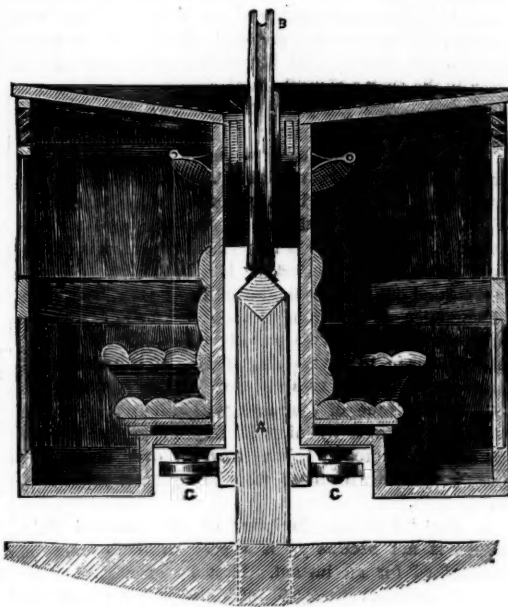
"Francis C. Bartlett, the inventor, has made an estimate showing that the cost of building two lines of railway on this plan—one for up-trains and the other for down-trains—to extend from the City Hall to Harlem Bridge, will not exceed \$2,500,000, and that it will require, at five cents fare for each passenger, only 9,500 persons to pass over the lines daily in order to pay 7 per cent. interest on that amount of capital."

Before this had come to our notice, we had cut from the *English Mechanic* the following account and illustration, which we have copied, of a system of one-rail railroad, designed by Mr. J. L. Hadden, Director of Public Works at Aleppo, Syria:

"The permanent way consists of a wall about a yard in height, on the average, and of the requisite thickness, on the top of which a single rail and sleeper is laid. Earthworks are almost wholly dispensed with, as the wall will vary in height according to the minor undulations of the ground, while bridges, even of large span, need consist only of a single iron girder, or if built of stone, would be in reality but a thin slice of an ordinary bridge, the width at the top being not more than a foot. The rolling stock consists of double carriages arranged in pairs, one on either side of the wall, as shown in our engraving, which represents the permanent way as constructed of timber; these carriages are connected together at the top only, and the whole of the weight is borne on the vertical wheels, one of which is shown at B. The under side of each carriage is provided with horizontal friction-wheels, C C, furnished with springs, which preserve the balance by pressing against the wall on either side, near the base. In the case represented they press against horizontal timbers; but with a stone, brick or concrete wall it would, in Mr. Hadden's opinion, only be necessary to dress or plaster the parts where these wheels touch the wall. The locomotive consists of two vertical boilers, one on either side of the wall, with wheels in similar positions to those on the carriages, but the horizontal wheels will be the driving-wheels, and are to be made capable of gripping the wall with any desired amount of force. They will be tired with india-rubber, so as not to damage the cement or plaster surface, but this latter is dispensed with on steep inclines, the rougher face of the brickwork giving more adhesion. Oscillation of the carriages is prevented by the springs of the horizontal wheels, one of which will as a rule press against the wall-face, although, when the speed is considerable the vertical wheels will run steadily upright, without inclination to one side or the other. These carriages are intended to accommodate eight persons, back to back. A speed of 25 miles is considered the economical maximum on a wall of brick or stone, but if higher speeds are required the main wall should be of concrete. It is obvious, however, that the 'wall' itself admits of a

great variety of materials, and depends in a great measure on the resources of the country through which the line passes. It may be constructed entirely of wood or iron, the sleepers being carried on pillars firmly braced together; in fact timber would be best for crossing marshy ground, where the expense of a foundation for a stone wall would be something heavy; while, on the other hand, a rocky soil is admirably suited to the requirements of a brick or stone wall. The cost of this system is from £500 to £1,000 per mile of single line, but for postal and very light traffic (i. e. carriages holding four persons, and wagons carrying 15cwt.), it can be constructed for £300 per mile, which is the cost of that now in preparation at Aleppo. Locomotives and other rolling stock on this system are in course of construction, and can be obtained from firms in Manchester. The whole of the details appear to have been well worked out, and the plan certainly offers the advantages of railway communication on a small scale to those countries who cannot afford a full-sized railway, and could not support it if they had it."

The first impulse on seeing and hearing of these plans is to smile at their apparent absurdity, and yet it is by no means certain that they are as ludicrous as they appear. In fact, on examination it will be found, we think, that the proposed system presents many advantages for a road through a crowded city, where passengers alone are to be transported. It would, in the first place, occupy but little room and be hardly any obstruction to light, ventilation or travel on the street where it is located. The posts could be located at the curb-stone—where telegraph poles are usually placed—so as not to obstruct either the street or sidewalk any more than it is now.

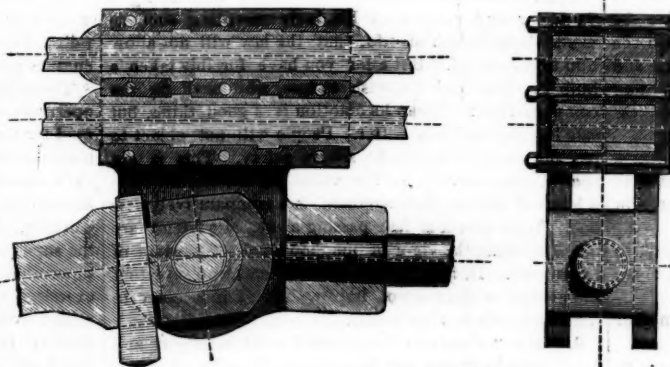


Single-Rail Railroads.

Second, the cars would be perfectly safe, as it would be impossible for them to run off the track.

Third, the road and its equipment would both be very much less costly than any of the plans yet proposed for rapid transit in New York.

These advantages, we believe, are worth serious con-



Improved Cross-Heads.

sideration. It should be remembered, however, that the success of such a project would depend almost entirely upon the way it was worked out, and this could only be done well by persons of ripe experience, skill, ingenuity and—common sense.

Improved Cross-Head.

The engraving herewith represents an improved cross-head for locomotives, designed by Mr. Thatcher Perkins, Superintendent of Machinery on the Louisville & Nash-

ville Railroad, and used by him on ten-wheeled engines built for that road. On a locomotive of that kind, the first pair of driving wheels usually is placed between the guides. It is therefore impossible to use ordinary double guides for the cross-head without spreading the cylinders farther apart than is desirable, as the crank-pin and coupling-rod are in the way. If single guides are used, consisting either of one bar above the piston-rod or of one above and another below, it is difficult to get wearing surface enough, for the slides of the cylinders are large, and the pressure on the brasses consequently very great. Two guides—one above and the other below the piston-rod—possess no advantage over one only; as the pressure on the slides is on one of them alone, while the engine is running either way—being on the top one while running forward, and on the bottom one running backward. In the cross-head which we illustrate two guides are used, both above the piston-rod. This gives double the wearing surface, or as much as on the ordinary double guides which are placed on each side the cross-head.

The drawing will be sufficiently clear, so as not to require any explanation, the one figure being a longitudinal and the other a transverse section.

Contributions.

OVERWORK ON RAILROADS.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The *New York Times* of February 5 has an article with this heading, and, in speaking of certain English roads, mentions cases in which men had been worked for long periods of time. One engineer was kept twenty hours on his engine, and a porter worked for four days twenty-three hours a day. Under any circumstances, no press of work could have warranted such an amount of labor being placed on any man. It is not in the power of the strongest to stand it. The *Times* says it is wicked to trust the lives of passengers to an engineer tired and worn out by fatigue, for under such circumstances no man could be expected to perform the least manual labor with care or precision, try he ever so hard. Undoubtedly this is so, and an engineer in charge of a train must have, or certainly is expected to have, all his wits about him during the hours of his work. The driving of an engine is perhaps one of the most fatiguing operations. Not only are a man's physical powers called continually into play, but he is at all times under a heavy mental strain. Time and habit may have accustomed him to the situation, but never is his mind at perfect ease till his engine and passengers have arrived safely at their destination. I think the statistics would show this class of men to be very liable to nervous disorders, but in many cases the robust health in which they are preserved by constant exposure wards off disease which would attack men of a weaker physical organization.

These remarks apply with equal force to every man employed by a railroad company. All are put into positions of trust and responsibility, and, unless they are men of singular callousness, feel how much depends upon their proper discharge of the duties intrusted to them. If this was not so we would be reading of casualties in every direction, and railroads, from being a very safe mode of travel, would become the most dangerous. One reason is generally overlooked in the wholesale blame which, after an accident, is so freely showered on the heads of all hands concerned in the catastrophe, and it is this: a poor switchman may not—in fact cannot—feel any personal interest in the passengers contained in the approaching train; but there is always some friend—a brakeman, an engineer, somebody on that train with whom he is on friendly terms—and his personal feelings are aroused. He does not want to prevent an accident simply because an accident ought not to occur; he knows it is a very dreadful thing, but if he had no friend in the train his interest in the matter would be very much less, and in proportion as his interest was lessened so would his care and watchfulness be less. There is no body of men so bound up together in the great bond of common danger as railroad employees. Perhaps a ship's company more nearly approaches it.

To take up the subject over which so many coroners' juries have puzzled their unprofessional brains, "Who was to blame?" Now, we don't want it understood that we are trying to defend pure carelessness, for it can't be denied that accidents sometimes occur from this cause; but we want the blame put on the right parties, and we have endeavored to show how seldom any casualty *does* really occur through carelessness on the part of the officials. This being so, who should have the odium of the misfortune charged upon them? But first let us look at a case: An express train is thundering along of a cold winter's day. Every-

thing seems right; the track signals denote the line open, and an accident does not seem within the range of human probabilities, when suddenly the train, or part of the train, is precipitated over an embankment. Who was to blame? Clearly nobody could have told that a certain rail would break. The most minute inspection would have found no defect; and a verdict is rendered according to the circumstances. Is it not probable that men may act just like a rail? They may be tried and strained till a time comes when it is no longer possible for them to avoid some act, neglect some duty, forget something. And this is the truth. Men are often ordered to do impossibilities. They are not the ones to question, but have to act according to the orders given; and when the inevitable result has come, they are too often made to take the blame.

Many accidents have occurred from overcrowding a road; that is, attempting to run more trains than the road is capable of passing, or, perhaps to express it better, more trains than the road can pass over it in its present state of organization. Look at some of the English roads, or at least some crossings where accidents are most likely to occur. See the extreme care exercised, the money spent to make everything work well. Apparently human ingenuity could devise no better means. How do we manage? With organizations defective at best, we add trains to our time-tables, put them at certain places at certain times, and on paper it all works well; but we have not increased by one, perhaps, the number of flagmen; we have made scarcely any provisions for the extra traffic; and then when the accident comes we are apt to blame the innocent cause. Surely it is no fault of the engineer if his time-table calls for him to run faster than his engine is able, or if his train is too heavy to be hauled at the very rapid speeds required. We can go on; but what is the use. If officials ask men to do that which strain or resolution cannot accomplish, the result is inevitable. And, as we said before, the physical system can perform a certain amount of work with precision, varying in each individual, but it cannot be bent further without the liability of a breakage.

We have been in this country very much behindhand in having civil engineers for certain divisions of road, a thing in which every road abroad exercises the greatest care. In no other way can bridges and other delicate portions of the track be properly attended to. A general engineer is not enough; he cannot know every section thoroughly; but competent men can be employed who, having comparatively small sections under their care, can watch every change and note all growing defects.

NOTES ON THE MANAGEMENT OF AMERICAN RAILROADS.

BY A HINDOO.

[CONTINUED FROM PAGE 60.]

The notes published on pages 36 and 47 of the RAILROAD GAZETTE, on train dispatching and discipline, have elicited from a friend of mine a long private review of my utterances. The experience and acknowledged ability of my critic give a value to his views which his modesty makes him underrate. Moreover, his position enables him to know the opinions of men in authority, and he assures me that he conveys not his own ideas only, but the thoughts of several other "heads." Desirous as I am, and many of my acquaintances are, of seeing the RAILROAD GAZETTE made interesting and useful to the operating departments of our roads, I will here state and discuss briefly the views of my friend, much regretting that he has not thought proper himself to appear in these columns. His ideas may be classified thus:

1. That the notes are dogmatical.
2. That the public of this country would not submit to the petty tyranny of regulations such as are in force in England or still more so in France.
3. That a discipline such as I suggest is an impossibility, and no manager in this country would attempt to enforce it.
4. That I am altogether wrong as to the inefficiency of the present train-dispatching system.
5. That a stricter discipline and a train system such as I propose are not necessary with the amount of traffic on our roads, and would be too costly: in fact, all the possible advantages are not worth the certain outlay that would be incurred.
6. That what he calls my "wholesale condemnation of managers and conductors" is wrong, impolitic in my own interests, and calculated to give those who do not understand these matters a wrong impression.
7. That I have done myself no good by my notes.
8. That the system of inspection is one of espionage that must be hateful alike to master and man.

A very few words will suffice for each objection:

1. To the first charge I plead not guilty. I am not

dogmatical, because I cram no dogma down anybody's throat. If I state a principle, I do so after having satisfied myself that it is true, and when I have arguments to support it; or else I hazard what appears to be true to be so—a likelihood, but which is open to discussion and to rejection, on cause being shown. I accept no rule as good merely because it is backed by a well-known name. The name certifies that the proposition is worth examination; but the name cannot outweigh argument. The *ipse dixit* of a practical man is of no more value than the mere declaration of a theorist. The difference between the practical man and the theoretical one is that the former has always some true basis for his opinions, while the latter has often no particle of truth in his cobweb. Now, if I accept no man's dogma, how can I expect any man to accept mine? How can I be dogmatical?

2. That the public of this free country would not submit to the rules and regulations is a matter of opinion. Some people say that in this country there is no desire for "seclusion." Behold our palace cars—a visible answer. Spite of all that purists may shrug their shoulders at, the love of right and justice in America is as strong, nay, stronger than in any other country, and the mass of travelers would willingly submit to any rule necessary to protect directly the interests of the shareholders and indirectly of themselves, provided, of course, that the rules be enforced in a proper way and not vexatiously.

3. That "a discipline such as I suggest is an impossibility." Even if true this is no argument against an approach to it. Every one wishing to improve, in any department of life, pictures in his mind an ideal and strives to produce the visible reality of his mental design. The lighter, the more perfect the ideal, the higher, the more perfect the reality. Is the difference among artists merely the degree of mechanical ability, or is it in the powers of mental grasp and vision? Is it in conception or portraying?

4. That I am "altogether wrong in my estimate of the inefficiency of our train-dispatching system," is a question of fact easily disposed of by those interested. First, examine the theory; secondly, examine the practice. If the theory is imperfect, depend upon it the practice cannot be perfect, or, if it is, then the theory is not carried out. My belief is that the theory, as well as the practice, is far from perfect. I know of two very serious cases within two years involving loss of life and much damage, to say nothing of loss of confidence. I have heard of many escapes, from the lips of witnesses. One man tells me of four such within four years at one station, witnessed by himself. My experience is not confined to one road; I have traveled over many, and have conversed with those who have greater experience than I.

5. That "a stricter discipline or an improved train service is not necessary," is a position that cannot be maintained for an instant. If it be granted that the present system is susceptible of improvement, then those who argue against improvement must show cause. Statistics—which, however, I do not possess—can be procured to show the amount of loss incurred each year by want of a perfect discipline. The cost of an increase in efficiency of the staff sufficient to reduce the chances of loss to a minimum can be easily shown. Compare the two. A difficulty will be encountered. What value shall be affixed to a life? What value on each limb? In civilized countries most people say life is priceless. A bargain beforehand may be struck with a man fixing a value for any portion of his body excepting such as would deprive him of life; that the law will not allow him to dispose of. But after you have forcibly taken a limb which he did not wish to lose, who shall fix the compensation? Cheap locomotion is a good thing, but safe locomotion is a better. People will not object to pay the sum necessary to secure safety. This is not special pleading. It is the voice of the times. The science of railway management is a comparatively new one, but its youth is fast passing away. Its friends are now expecting the vigor of manhood and the wisdom of experience. If, however, there is a man who says that the present system is not improvable, let him come to the front and show his colors.

6. "My 'wholesale condemnation of managers and conductors' is wrong, and injurious to the railroad interests." I have not intended to condemn, wholesale or retail, either individuals or systems, nor do I think that I have done so. In pointing out what seemed to me imperfections, it was intended that I should be set right if the views advanced were mistaken ones, or that a discussion should ensue which would result in improvement. I do not believe that one word has been uttered which can injure the interests I am paid to protect. If so, then all discussion should be stifled. Not one of the public will believe, not one can believe, that railroad management is perfect. It is not necessary that any one should so believe. On the other hand, confidence would be increased by an open desire on the part of railroad

managers to discuss questions of such vital importance to the whole people. The very best railroad man in America would not consider it beneath his dignity to adopt a good idea tendered him by an outsider. Discussion does not necessitate adoption. What may seem at first sight impracticable may on examination be found valuable practically, or easily made so by some alterations. It is already apparent that the want of discussion is leading to the foisting on railroad managers of impracticable rules framed by legislatures and unprofessional empirics.

7. I "have done myself no good by publishing these notes." With all deference to my friend, this remark is scarce worth noticing. Certainly if no one will come forward to discuss the matters I have treated of, I shall have done neither myself nor anybody any good. In the sense meant by my friend, I do not care whether I have improved my standing or not. If valuable in my profession, my services will be sought for; if not valuable, I don't deserve anything, and I have no right to expect anything. One thing I am quite certain of, that in America, of all places, there are few, very few, managers who would object to me because I do not shape my mind in their moulds.

8. The "system of inspection is one of espionage, hateful to manager and subordinate." How can this be true? Does any one assert that the duties of a general manager or an assistant superintendent are those of a spy? How absurd! Really this objection is not worth the paper and ink it is written with.

My friend's views, he tells me, are those of a practical man who has climbed from the lowest rung to one not very far from the top of the professional ladder, and as yet he has not seen the necessity or use of "trying after any device that cannot be at once put in practice." The answer is that a practical man who does not raise his head to look around, above and beyond the narrow round of daily routine may improve surely, but in all truth slowly.

In the United States there are in round numbers 60,000 miles of road. How many thousands of able, experienced men must they employ. Will none come forward to teach their younger brethren, or are they afraid of all speaking at once?

Since writing the above, an account has been telegraphed of a collision on the Rockford, Rock Island & St. Louis Railroad near Alton. Particulars are not given fully, but it was apparently a butting collision. What does the train dispatcher say?

[TO BE CONTINUED.]

TRAIN DISPATCHING ON AN EASTERN RAILROAD.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I have had about twelve years' experience in moving of trains by telegraph, and would state that I know of no branch of railroading that has improved more and is more worthy of praise. The inestimable value, efficiency, safety and reliability of moving trains by telegraph are incomprehensible to those that are unacquainted with the system. Railroad superintendents who have experienced the proficiency of a well-conducted railroad telegraph line for the movement of trains can appreciate its value. That it increases the facilities of a railroad one-fifth there is no doubt, in getting engines and cars over the road with more dispatch than by any other means known to railroad men, thereby giving large additional service of engines and cars.

The organization consists of a corps of good railroad operators placed at the most convenient points on the road for the dispatch of business, with a day and night train-master, whose headquarters are at the superintendent's office. The train-master must have a thorough knowledge of the rules of the road and their practical working. He takes charge of the road in the name of the superintendent, and during temporary absence of the superintendent from office attends to the duties of it. He exercises a general supervision of all employees connected with the trains, and sees that the rules and regulations are fully understood and observed by them. Before being relieved from duty, he is required to make a detailed report of his operations for the day or night, as the case may be, to the superintendent, inclosing to him all orders sent and telegrams received relative to the working of the road; the answers to all train orders are recorded by the operator in a book for that purpose and retained for future reference.

On all well-conducted railroads there is a rule for the government of the trains represented upon the time schedule. It is when the trains upon the time schedule fail to make their time that the train-master's labor commences. He makes meeting points for them, thereby keeping them moving with regularity and dispatch until the meeting point or the destination of the trains is reached. That

you may understand its working, I will give you a few of the important rules to be observed:

1. All orders for the movement of trains must be communicated in writing—addressed to the conductor and signed by the superintendent.

2. Conductors receiving train orders must send by telegraph to superintendent their understanding of them, and must not leave the station until their message is sent and the answer "Correct" is received in reply. The signal "Ans. 31" appended to a train order means "Answer how you understand my message and get my reply before you leave."

3. The operator receiving the order will first read aloud to the conductor, then send his reply, and, after getting answer "Correct," will indorse it on his order "O. K." and his own name, then hand it to the conductor.

4. No conductor will run on any order without having in his possession a written copy with "Correct" to it, signed by the superintendent and indorsed "O. K." with the name of the operator receiving it.

5. Conductors and engineers passing telegraph stations where they do not stop per schedule must be on the lookout for signals to stop for orders.

6. Freight trains must be clear of the main track not less than fifteen minutes before any passenger train is due, and, when passed by a passenger train moving in the same direction, must not start to follow it until ten minutes after departure of the train.

I would here explain the word "rule" which is substituted for schedule. The telegraph order annuls temporarily the schedule; hence when order is executed or fails, conductor is ordered to "go by rule" (by schedule).

If a passenger train is two hours late, and its maximum speed was 1½ minutes to the mile, or forty miles per hour, the train-master would take this as his base of operations and see to what point he could move the freight train in the same direction on the time he had to do it in, giving the following order:

"Conductor Express No. 1, North.

"I have given Freight No. 1 until 10:40 a. m. to make — for you. Run one hour and twenty minutes late at all stations until you pass it. Ans. 31.

—, Superintendent.

"Conductor Freight No. 1, North.

"I will give you until 10:40 a. m. to make — for Express No. 1, North, and from there go by rule. Failing to make that time, go by rule. Express No. 1, North, will run one hour and twenty minutes late at all stations. Ans. 31.

—, Superintendent.

If it becomes necessary to move freight in the opposite direction, the order would be as follows:

"Conductor Express No. 1, North.

"I have given freight No. 2, bound south, until 10:40 a. m. to make — for you. Do not pass that station before that time, unless it has arrived; then go by rule. Ans. 31.

—, Superintendent.

"Conductor Freight No. 2, South.

"I will give you until 10:40 a. m. to make — for express No. 1, North, and from there go by rule. Failing to make that time, go by rule. Ans. 31.

—, Superintendent.

The order must always be issued first to the train having the right of road, as soon as it is in the possession of the operator, who will deliver it to the conductor of the train. Then the order is given to opposing train, and as soon as proper answers are received, orders are "corrected." It is not necessary to have both trains at the same time, or to hold one train until you get the other. It is only necessary to get the order to the operator, whose duty it is to deliver the order and get the understanding from the conductor.

This is the system in use on this road, and if any Western railway has adopted anything superior, I should be pleased to hear from it through your valuable publication.

AN EASTERN RAILWAY.

PAPERS ON BRIDGE CONSTRUCTION.

NO. IV.—ON DESIGN AND CHARACTER OF WORK.

[CONTINUED.]

The questions involved as to the relative merits of "welding" and "up-setting" have always been subjects of discussion among engineers. Both have their advocates, and both have been used with good results. The main objection to welding springs from the possibility of imperfection in the process, even when most carefully done, and which a test does not always reveal. A remarkable discovery by a Mr. Saxby, of London, showed that by a certain application of the magnetic needle, concealed flaws occurred on government *proved* chains that had been made with the greatest care. On the other hand, the principles involved in up-setting would seem to have a deteriorating effect upon iron bars. This process is either performed by the continuous pressure of the hydraulic press, or by repeated impact on the end of the bar. It is unquestionably true that iron is most susceptible to change form without deterioration when in a highly heated state; and, since the bar begins to cool the

moment it is taken out of the furnace, the most rapid means of forming it would injure it the least. A fibrous bar operated upon in a cold state will be so modified in its molecular arrangement as to become coarsely crystalline. Again, in operating upon the end of a bar just from the heating furnace, it must of course be firmly gripped behind the die and when the iron is comparatively cold. In the case of slow up-setting by impact, the iron is gradually crowded back from the soft end, the effect of each blow being less and less as the metal gets cooler and the fibres become compacted. At the end of the operation the metal will have chilled off rapidly and near the base of the up-set be almost cold. At the point of grip, the metal becomes more or less crystallized according to the temperature at that point. This theory is borne out by experiment and points to the rapid continuous process of the hydraulic press as the proper one to be employed where up-setting is resorted to for forming eyes or enlarged screw-ends. Even by this method a certain deterioration must result in the bar just below the up-set, although in a much less degree than by the process of impact. Where wide and thin bars are enlarged by up-setting, in order to form a head for pin connections, there must be an enormous distortion of fibre, since a large amount of iron must be forced back to fill the moulds or dies. It would be interesting to plane off a head so formed and develop the fibre, or what is left of it, by acid. Judging from the nature of the process and the form of the bar so operated upon, we might reasonably expect to see a bewildering mass of crinkled and distorted fibre, rather foreign to what most engineers would like to see in so vital a portion of their bridge frame as the heads of their links. To make up for this peculiarity of the process, a much larger amount of metal would be required in the head than is usually allowed, probably from 20 to 25 per cent. A good method of welding, practiced by more than one of our most successful bridge firms, is that known as the "split weld." This is done by splitting the bar and introducing a piece of the desired enlargement, both being hammered together at welding heat in a hollow coke fire. The manner of making wide their links at the works of the Watson Manufacturing Company, Paterson, N. J., is probably the best manner of applying the welding process to such a purpose. At these works the heads are formed from plates of the true width of head when finished. They are subjected to blows alternating edgewise and on the flat sides. The first shapes the heads between dies occupying one-half the face and anvil block of a steam hammer, the rest of the face and block being flat, so as to give the second blow on the flat side of the bar, thus preventing mashing the bar sidewise as continuous edge blows would do. The fibre in this method curves gradually with the pin hole, and is subject to no distortion. Two heads are thus made at once, connected by a short neck, the width and size of the bar to be "headed." They are then cut apart, the ends sharpened for welding to the ends of the bar split to receive them—the weld, of course, being made in a hollow fire. Another method is suggested, which would seem to promise a good arrangement of fibres in the head and yet do away with the welding. It is to place a short piece on either side of the end of the proposed eye-bar, with the fibres at right angles to those in the bar. Bring the whole to a welding heat, and forge down to form in a die. It is fair to suppose that this method will lock the fibres well together without distorting them, as in the direct up-set, and yet form a bar practically weldless. Bars formed in this way, under the writer's observation, were as handsome as any die-forged bar can be; but without direct experiment it is impossible to speak of their value as positively as theory would indicate.

Where so much successful work has been accomplished by means of the impact and hydraulic process, it might seem flying in the face of experience to condemn them, and yet if the discussion advanced above is based upon correct views, it seems to warrant the conclusion that they should not be employed in work of this character when better methods are available. With all the chances for a poor weld, they seem to be outborne by the certain change in the value of the iron in almost any up-set bar by impact; but it must be done well and thoroughly.

The testing of bars before use has been objected to by many engineers on the seemingly plausible ground that the test may weaken the bar imperceptibly, and that therefore the safety of the structure must be endangered. On the other hand, they say, it is impossible to know about the character of the iron and the work put upon it without subjecting the bar to some test in excess of the working load. It is a choice of evils, perhaps, with a weight in favor of testing; for if we know anything about the quality of the iron before it has been operated upon, the chances of injury under a strain inside the elastic limit ought to be very slight indeed. Some risk must be run in every human undertaking, and

all that can possibly be compassed is to reduce that risk to the minimum.

In selecting constructive forms and arranging details, there is a strong and growing feeling among engineers that they should be so selected and arranged as to allow all parts, so far as possible, to be accessible to painting and inspection. Iron bridges are of very recent origin, and there are none that have been erected long enough for us to determine the amount of deterioration (if any) that takes place in a closed wrought-iron column or chord. While any evidence advanced in their favor must be entirely negative, the mere fact of the possibility of slow internal corrosion warrants every care that science is able to bestow, in using all means to perpetuate the life of a structure so costly as an iron bridge. The scaling and rust scraped from the Menai tubes are often alluded to in confirmation of this view, and this bridge, not yet thirty years old, may be regarded as the oldest of the cellular constructions in wrought iron.

ALF. P. BOLLER, C. E.

New York, January 29, 1872.

THE SOUTHERN ROUTE TO THE PACIFIC.

NUMBER ONE.

SAN FRANCISCO, January 22, 1872.

A journey recently made across the continent from sea to sea, by the southern overland route, has put me in possession of some facts, gathered by personal observation and conversation, which may have a general interest to your readers. I am the more induced to think so for the reason that we journeyed pretty nearly on the probable track of the 32d parallel or Texas Pacific Railroad—if that road shall be constructed. The constantly recurring necessity to the train-captains of searching for grass, wood and water—the elements in the daily "rule of three" by which all problems of emigration across the Plains must be wrought—impelled us to make sharp note of the plain, homely facts, of those conditions and capacities which determine the availability of any land to the fundamental uses of civilization. As to the mineral resources of those great visceral regions of the continent I shall say very little, for the indications of such wealth are less readily discernible to the cursory glimpse of an emigrant than those of the grazing and agricultural capacities; and the latter are, in fact, greatly more important in the present instance, for no railroad can live fifteen hundred miles on quartz and sulphurets, no matter how rich. I seek by no means to disparage the mineral riches of Arizona and New Mexico, ascertained and conjectured, which are undoubtedly large. Great findings of ore in those regions, or even those already made, would doubtless assist in driving a railroad through in advance of the more sluggish demands of semi-Mexican farming and a wholly Mexican system of grazing, even as such discoveries were the means of kindling early the grand energy of California; but the day of exhaustion must come to many, and the day of decline to all, and then a railroad must find its *raison d'être* in the broad, general soil.

The region to be traversed between Marshall and San Diego is susceptible of division by sharp boundary lines into certain unique tracts, each possessing a body of qualities which distinguishes it from the others, as the prairies, the plains, the mountains, the Rio Grande Valley, etc. Of these, the first is

THE PRAIRIES.

On the route which we pursued the prairies extend as far westward as the Colorado, which river cuts sharply between them and the treeless plains (for it is a characteristic of the Texas prairies that they are much more wooded than those of Illinois or Kansas). About the Trinity and Waxahatchie (speak, Waxahatchie) there are vast sweeps of dead-level, unbroken grass; but as you go westward, the prairie rolls up more and more into broad ground-swells, like Atlantic waves, only they are often a mile across, with groves and clumps of trees interspersed. The depression of the basins or valleys of the above-mentioned streams is slight, and the thread-like lines of trees on their immediate banks would enable one flying over in a balloon to trace distinctly the ramifications of the streams, like great clumps of sea-green coral flung down upon the dark-green sheet of the prairie. The flats or bottom-lands of the Trinity are depressed six or eight feet below the level of the prairie, are about half a mile wide, and, in a rainy season, the jet-black, wavy mud is almost fathomless.

After you leave the red-clay or cotton land of the Sabine hills and enter upon the prairie, you travel over a bed of underlying limestone, which is unbroken and easily traced 250 miles or more to the foot of the Apache Mountains, where it dips under the reddish granite, but reappears in sporadic masses fifty miles distant on the other side, and finally assists in giving color and body to

the Sierra Blanca (White Range) which skirts the Rio Grande. On the edges of the creek and river basins it crops out in crumbly strata, showing frequent but generally ill-preserved organic remains. By its softness it renders the water of the prairie wells so "hard" that those residents who have sufficient enterprise construct great wooden tanks, underground or above, for the storing of rain water, which is thought to be less conducive to the ague, so prevalent hereabout. As far west as Buchanan the prairie is divided principally into two classes, the black, dense, curiously-pitted "hog-wallow," and the mahogany-colored, lighter "hummock." The latter may be recognized at a glance by the clumps of little honey-locusts which it produces, while the hog-wallow, though incalculably rich, yields little but marsh grass.

The narrow belts of forest along the banks of the stream consist of pin-oak, red-oak, black-oak, ash, elm, pecan, hackberry, etc. and furnish sufficient quantities of wood and fence-rails so that the farmers seldom have to transport those necessary articles over four or five miles. Wild turkeys, prairie chickens and rabbits abound, especially the prairie chickens; in the dark, dark jungles of the Trinity bottoms a bear is occasionally seen, and frequently the traveler beholds a flock of pretty cotton-tail deer—the Graces of the forest—lightly skim across a bit of prairie, between grove and grove.

SEASONS—CULTIVATION.

One great drawback of this noble region, even as far east as the Trinity River, is its liability to severe and protracted drought. Mr. Porterfield, an old and intelligent resident near Waxahatchie, told me that region was afflicted with seven years of continuous drought, the last four of which were coeval with the rebellion; and so hard did the dryness gripe the land that there was a good deal of distress, and there would have been positive famine but for the great herds of cattle which were able to subsist in some manner by browsing in the river forests. Those four last years of pinching in Western Texas were deeply graven on the memories of the rebellious by the exultation with which numbers of the Union men spoke of them as a Providential chastisement of the secession.

To say nothing of the dry Texas northers, which have attained a "bad eminence" the whole Union over, I think there are few things in nature so pitiless, so spiteful, so persistent as one of those spring or winter rainstorms of Western Texas. Within twenty-four hours the wind will frequently box the whole compass, spitting without cessation a keen, cold, stinging rain, blustering, shrieking around the wretched log-cabins, while the rain-drops are picking out with slanting stroke the worthless limestone mortar in the chinks, and with it white-washing the logs; and so, holding on day after day, until the poor houseless cattle, crowding down on the low river banks to escape its violence, have their backs arched up in semi-circles. Many and many a skeleton shall you see on the prairies, when they are growing green in spring, with a saucy, red-jawed buzzard standing lordly up on top of it, or peering out with an eye between the ribs, while he suspends for a moment his gluttonous work within.

The farmers naturally avoid the hard, black hog-wallow, and settle on the higher and lighter hummock, which alone, with the present shiftless modes of cultivation, is tractable to the plow. As far west as the Trinity no cotton is grown, nothing but wheat and corn, except a few indifferent gardens. On this vast limestone belt above described there is practically no limit to the yield of wheat except the droughts and the thriftlessness of the farmers; yet, as it is, the actual yield per acre about Waxahatchie is not much above twelve bushels. Very few farmers have steel plows, which are absolutely needed to rip up the fat, mahogany prairie; the share is seldom put down deeper than four inches into the ground; no manure is ever employed; little care is used in selecting, varying or importing the seed; plows and reapers are oftener left in the field all winter than they are housed. The ground is prepared for corn in the same slight manner. The furrow in which the kernels are dropped generally bottoms on the unplowed soil, so that the roots cannot penetrate the virgin earth for moisture when it is sorely needed in summer, but spread out flat and grow in a sheet on the hardpan. The corn is covered with two furrows, one on each side, and when it begins to struggle up to daylight a harrow is dragged over the ground to take off clods, break the rain-formed crust, if any, and assist the young shoots in making their appearance. By this rather harsh means a better "stand" is generally secured than one could expect, and the young corn grows with amazing vigor for a time, but presently the summer droughts begin to pinch it, the iron-hard soil below refuses it sustenance, and it is cut off in the greenness of its large promise, and yields only a beggarly thirty or forty bushels per acre, whereas if the ground had been thoroughly plowed and subsoiled there should have been ninety or one hundred.

ON THE BRAZOS.

We have now traveled far enough west to find, in the shallow river-basins, the live oak, the mesquite bush and the best type of the famous mesquite grass—the curly mesquite. Old herdsmen recognize five varieties of this grass, of which they tell me that only three are found as far north as the latitude of Waxahatchie, to wit: the curly, the running and the redtop. The redtop, which is almost absolutely drought-proof, we shall find principally on the plains; the running variety is also particularly valuable, though not frequent in this region, but is often found on the Nueces. The curly mesquite always grows on low moist bottoms, equally well underneath the mesquite bushes, which abound there; is of a pale tender green color, soft, low, and covering the ground with a thick, cottony fleece. Its fattening qualities are wonderful, and it is excelled in this regard only by the grama grass (the grass) of New Mexico.

East of this there prevails in the thin post-oak groves and clumps a tall, broad-leaved, bluish grass, called post-oak grass, which, though it would yield thrice the weight of hay per acre that would be produced by any variety of mesquite, is nowise comparable to it, especially the curly mesquite. On the hummock prairie there is still another kind of grass, for which I know no particular name, which is only about equal in quality, and scarcely equal in quantity, to the post-oak grass.

In the vast, gently-sloping depression of the Brazos, then, this choice mesquite grass furnishes some of the finest pasturages, natural or artificial, in the world. A veteran herdsman—F. Wurzbach by name, resident near Castroville—tells me he discovers signs of a gradual amelioration of the climate in Western Texas, of an improvement in the humidity of the atmosphere, which is indicated by the springing up of mesquite bushes and the inseparable curly mesquite grass in tracts where they were not known fifteen years ago. The mesquite bush is salamandrine in its capacities, but loves moisture nevertheless; and it is certainly noticeable that there are now broad areas covered by a tolerably dense growth of this bush, in the Brazos bottoms and elsewhere westward, showing a growth of only ten or twelve years, where there is not one mesquite tree now standing within acres. I suspect, however, that these have sprung up since the seven-years' drought above mentioned, and that the old trees have been obliterated by the fires which doubtless swept the country then, for the mesquite when dry burns almost like tinder.

WEST TO THE COLORADO.

Beyond the Cross Timbers there is no more cultivation, except of little corn patches, wherein that cereal has a hard struggle, standing on tiptoe to look out over the heads of the flaunting weeds. The herdsman's house is generally planted hard by a spring, under the protection of some broad, overshadowing live oaks, with a low, skulking rail fence around; a corral at hand, with its strong stall for branding cattle in; and rawhide everywhere, serving for nails, mortises, chair-bottoms, well ropes, bedstead bottoms, etc. The family subsist chiefly off beef, bonny clabber or buttermilk, and cornbread.

There is a notable and tedious monotony in the landscapes. First, the pale green mesquite lawns along the river basins; second, the rocky limestone plateaus, sparsely covered with coarse grass, cactus, ragged, frowy wisps of chaparral, and stunted, half-dead, live-oaks; third, those singular, straight, rigid, military-looking, limestone ridges (called *lomas* by the Mexicans) so characteristic of Western Texas, with just enough chaparral and harsh grass covering them to rescue them from absolute nudeness, and yet leaving them so incandescent in the midsummer sun that they are painful to look upon. Occasionally there are immense forests of post oak, so thin that the luxuriant grass grows thickly over all the ground; the trees all stunted, stubby and disproportionately large at the butt, as all trees are compelled by the fierce northers to grow on the prairies. At the foot of one of those strange-looking ridges we passed a saltlick of an acre or two, which unnumbered generations of buffalo and cattle had licked into a stonehenge, the pillars of earth being often six or eight feet high, each one capped by a rock or a tree. The immense amount of earth which has been licked away here gives one a vivid conception of the great antiquity of the globe, as also of the grazing capacities of Western Texas.

As far west as the Paloxey probably irrigation will never be resorted to to any considerable extent; but beyond that to the Colorado, except on the moistest of the narrow "mesquite flats," no useful crops at present known to American farmers will ever be grown except by irrigation, and that, too, chiefly from wells. None of all these streams, until you reach the Pecos, are swelled by the melting of mountain snows, and are consequently most languid when most needed; besides which, their fall is so sluggish and so long that irrigating canals would require to be very much drawn out in order to bring the water upon the prairie, although the river

banks are generally only eight or ten feet in elevation. This only on the narrow bottom-lands (where, at any rate, the wonderful fleece of mesquite grass is worth nearly as much as any crops that art could produce); while the plateaus must depend almost entirely on wells of some description. The soil is generally very good, dark and rich in limestone, even on the rockiest plateaus, and well adapted for wheat; but the unknown quantity in the problem will be water. They are seldom less than twenty-five or thirty feet above the spring and summer levels of the streams, and *acuías* long enough to carry the water upon them would expose a great deal of it to evaporation before reaching its destination. In addition to that, a very considerable portion of the surface is heavily rolling, verging upon hilly, yet preserving its prairie characteristics, and irrigation there is, therefore, practically removed from discussion.

But if the prospect is so slender for other than irrigated crops, I see not why grapes should not do remarkably well in Western Texas, for there is the same summer glare, the same glowing incandescence that I have seen on the famous Hockheim plains, and about the head of the Adriatic, where ripen the pleasant wines of Terlan and Lagarina. That singular whitish glow of the country, and the whole geological formation resemble those of Southern France, especially around Marseilles; and often when looking down from one of those curious terraced knolls upon the pale green stretches of the "mesquite flats" I could easily have believed myself again standing on a hill in Southern France, gazing down upon a vineyard. I am confident the vine will flourish well throughout extensive regions of Western Texas, for they are no whit more desert-looking than many a California valley was for five months of the year before it was tilled; and the soil is strong enough. One drawback not known in California is the terrific hail-storms which sometimes come in the spring and early summer.

I had intended to say somewhat of the stock and other matters, but this letter is already too long.

STEPHEN POWERS.

American Rolling Stock in South America.

The following is an extract from the report of T. Boyd Thompson, Manager of the Northern Railway of Buenos Ayres, to the directors of the company in London, dated at Buenos Ayres, June 27, 1867:

"Our present stock or first-class carriages consists of twelve in number, viz.: ten made by Brown & Marshall, of Birmingham, and two of James Gould, Albany, New York. The two last mentioned will seat each comfortably 64 passengers, and are supposed to weigh from ten to eleven tons, or 385 lbs. dead weight for each passenger. The ten made in England have accommodation for 60 passengers, and each carriage weighs 16 tons, or 597 lbs. for each passenger, which, in comparison with the other, shows a difference of 213 lbs. of extra weight for each passenger. On working days there are on an average eight trains, viz.: four from each terminus, each train never having less than two first-class carriages attached, which, according to the above statement, makes 10 tons more for each train than if made up of American carriages only. The extra 10 tons has to be passed over the line eight times per day, or a total of 80 tons per day, equal in weight to 1½ ordinary trains. We find also that three American carriages only weigh one ton more than two of English make; the three American carriages seating 72 passengers more than two English, against the same amount of dead weight. During the past ten months the repairs done to the ten English carriages amount to \$40,866 currency, or \$4,086 currency for each, while during the same period the American carriages have not cost anything for repairs, and are at present in better condition than those made in England, although they have been in constant use since the line was first opened. I may also remark that their chilled-iron wheels scarcely show any perceptible wear. The American carriages are in every respect a better and more comfortable carriage, requiring less than one-half the power to propel them than is necessary for carriages of English construction. It has also been proved that the English carriages are much more injurious to the permanent way and works, and likewise, in proportion, more destructive to themselves than those of American construction.

"For the long-timber traffic, I consider that platform cars of American make would be preferable to any other class. I therefore beg to conclude these remarks with most strongly recommending the American-made carriages and wagons, and from experience of their working on the Boca and this line and their fitness for our traffic. They cost less, are not so expensive to keep in repair, run easier, and cause less wear and tear on the permanent way."

NOTE.—The above extract is "verbatim" from the printed report of Mr. Thompson to the company in London, a copy of which I sent to London for, and which is now before me. The convictions of Mr. Thompson, who was never in the United States, must have been very strong for him to write such a report. At the time the Arica & Tacua Railway Company of London lost all their rolling stock (but one train) by the earthquake of August, 1863, in Peru, they sent to me for new rolling stock, which I had made here and sent out within the last year.

W. W. E.

AMONG THE SHOPS.

GRANT LOCOMOTIVE WORKS.

This establishment is full of work and is now turning out twelve engines per month. By making alterations and additions, the proprietor has made what is substantially a new erecting shop, 125x100 feet, which is now occupied. The old blacksmith shop which was formerly in the center of the cluster of buildings which form the main shops, has been removed across the street, so that the room which it formerly occupied is now thrown into the new erecting shop.

We were shown a very ingenious contrivance for transferring the engines from the erecting shop. It consists of a sort of table similar to that of an ordinary turn-table. In the center of this is a hydraulic ram by which the whole weight of the table and that of the locomotive can be raised up so as to bear on the center pivot. It can then be swung around on the pivot so as to stand over a track laid at right angles with the pits. At each of the four corners is an ordinary flanged wheel, which is located so as to suit the track last referred to. After the table and engine are swung around, the pressure in the ram is allowed to escape, which brings the wheels in contact with the track, and the engine can thus be run out of the shop.

Two small Mogul engines are nearly completed for the Utah Northern 3-foot gauge road. They have 10x16in. cylinders, and have a sort of playful look which is almost ludicrous.

ROGERS LOCOMOTIVE WORKS.

The new erecting and machine shop at this establishment has recently been occupied. It is 195x56ft., and four stories high. It is arranged very conveniently, and has three elevators, two of them built by William Sellers & Co., of Philadelphia, and the other by Otis, of New York. Underneath the lower shop is a basement, in which are the heating pipes, wash-room and other conveniences for the men.

It is designed to have a small traveling crane over each pit in the erecting shop. To this is attached a pair of differential pulley blocks, so that a heavy weight can be raised and moved to any position over the engine or pit. At the rear end of the pits is an overhead track, with a light truck running on it. This also has a chain and a pair of differential pulleys, so that any heavy part of an engine can be easily raised and moved to any desired position.

We were shown a very ingenious attachment to a large cross-belt, which drives two lines of shafting at right angles to each other. There is ordinarily much trouble in getting such belts to draw or "lug" the pulleys equally over their whole surface. To obviate this evil, Mr. Hudson has placed a loose bearing pulley about half way between the two shafts. The axis of this pulley is inclined both horizontally and in relation to the two shafts, and stands parallel to the plane which the belt assumes at the point where the pulley is located. The bearings in which its shaft runs are held in position with set-screws, so that the pressure on the belt can be regulated just as may be desired. The arrangement works very satisfactorily, and the cross-belt with this attachment gives no more trouble than if it were employed to drive two parallel lines of shafting.

In the machine shop we noticed several new and improved tools, especially a large frame slotter built by Wm. B. Bement & Son, and a rocker-shaft lathe by Edwin Harrington, of Philadelphia. The peculiar arrangement of this latter tool is the attachment for turning the arms of rocker shafts. This consists of a crank shaft, located immediately under the main shaft or spindle of the lathe, which is driven from ordinary back gearing. The crank on this shaft is connected by a rod to a pin attached to the face-plate, which thus receives a reciprocating motion instead of revolving, as it ordinarily does. The tool-post has an attachment similar to that on a planer, so that the tool will raise up on the return stroke. The object aimed at with this machine is to economize the time which would be lost in turning up the arms of rocker-shafts if they were obliged to make a complete revolution.

Our attention was also attracted to two machines, one a double-head wheel lathe, and the other a horizontal boring and turning machine built by William Sellers & Co. We learned with a little surprise that as many steel tires could be bored out with the latter machine as on the two heads of the wheel lathe. The horizontal boring-mill seems to be admirably adapted to the work, and several of them have been employed for a long time in boring out the cast-iron ties used on the Baltimore & Ohio Railroad. They seem to have quite as many advantages for boring steel as cast-iron tires.

The Rogers Locomotive Works now employ from 1,100 to 1,200 men, and completed 18 locomotives in the month of January.

Ticket Agents' Meeting.

On the 14th inst. a meeting of general passenger and ticket agents of Western railroads convened at the Southern Hotel, St. Louis, being an adjournment of the meeting held in Chicago on 13th of January. The following were present: E. St. John, General Ticket Agent, Chicago, Rock Island & Pacific Railroad; A. M. Smith, General Passenger Agent, do.; W. P. Johnson, Illinois Central Railroad; W. H. Stennett, do.; J. S. Cook, Peoria, Pekin & Jacksonville Railroad; C. K. Lord, Chief Ticket Clerk, Indianapolis, Cincinnati & Lafayette Railroad; P. B. Groat, Hannibal & St. Joseph; Samuel Stevenson, Cincinnati, Hamilton & Dayton; A. C. Dawes, Kansas City, St. Joseph & Council Bluffs; J. W. Pillsbury, Marietta & Cincinnati; E. A. Ford, Missouri Pacific and Atlantic & Pacific; A. E. Touzalin, Burlington & Missouri River; C. B. Peck, Lawrence, Leavenworth & Galveston; Samuel Powell, Chicago, Burlington & Quincy; F. R. Myers, Pennsylvania Company; J. E. Follett, Vandalia Line; J. Charlton, Chicago & Alton; F. Chandler, St. Louis, Kansas City & Northern; W. B. Hale, Ohio & Mississippi; W. R. Allen, St. Louis & Iron Mountain; A. Anderson, Jeffersonville, Madison & Indianapolis;

lis; S. K. Hooper, Louisville, New Albany & Chicago; W. L. Malcolm, Toledo, Wabash & Western; H. P. Stanwood, Chicago & Northwestern.

E. St. John was chosen Chairman and Samuel Powell Secretary.

On the 15th the meeting was resumed, and it was determined to hold the next monthly meeting at Springfield, Ill.

A discussion was held on the policy of issuing passes to the advance agents of traveling concert, theater, circus and other troupes. There was also a discussion on the policy of reducing rates to conventions and meetings of various kinds.

A vote was passed in favor of abolishing "colonists' rates," which were a prominent feature in last season's business, and the rule established that first-class tickets shall not be sold at second-class rates, and no free passes be granted for colonists or emigrants.

The following resolution was adopted:

Resolved, That the so-called colony rates be hereby entirely discontinued. That for all parties moving westward, either in large or small numbers, regular first and second-class rates shall be demanded. That holders of second class tickets shall receive only the accommodation provided for second-class passengers. That free passes be discontinued on account of colony or emigration business. And that no excursion rates be given or round-trip tickets sold on cars or trains chartered between points east of the Mississippi and points west thereof.

The Accidents on the Missouri Pacific.

There were recently on the Missouri Pacific Railroad two or three accidents within a few days, all caused by rails breaking under trains during severe cold weather. Shortly after one of these a resolution was introduced into the Missouri Legislature calling for an investigation of the road, concerning which the President of the company has addressed the following frank and decided letter to the branch of the Legislature in which the resolution was offered:

To the Honorable the House of Representatives of the State of Missouri:

GENTLEMEN: The resolution introduced by the Hon. Wm. L. Hickman, and referred by your honorable body to the Committee on Judiciary, demands attention from me as President of the Missouri Pacific Railroad. This resolution as first introduced, referred particularly to recent accidents and "loss of life" on the Missouri Pacific Railroad, but was subsequently amended so as to include all the railroads in this State.

It is not the purpose of this letter to object to any action on the part of the honorable members of the House of Representatives, but to show that causes may and do often exist, beyond the power or foresight of man to control, producing accidents on railroads, and particularly during extreme cold weather, even when the management is of the most careful character.

If the accidents which have recently occurred on the Pacific Railroad were the only accidents that had taken place in the United States during the same time and from the same causes, the members of the Legislature might then safely conclude that the fault lay in the management of the Pacific Railroad; or if the recent casualties resulted from the collision of trains, showing either a poorly-adjusted time-table or dereliction on the part of employees, then the law or the community might attach blame to the company; but none of these were the case, and I regret that the honorable member, in introducing his resolution in relation to the Pacific Railroad, overstepped the facts when he included "loss of life," for in none of the accidents have been recently occurred, and to which he referred, has a single life been lost.

It is perhaps unnecessary to state here that no one can regret the occurrences alluded to more deeply than the managers of the Pacific Railroad, and that financially, at least, none will feel it more. The breaking of rails through the action of frost was the cause of the accidents, and that such causes cannot be foreseen and controlled is patent to all railroad men, and indeed to any one having experience in the action of the extreme cold weather upon iron. It may be claimed that more accidents have occurred within the last few weeks on the Pacific than on other roads. This may or may not be the case; but one thing is certain, that the accidents have resulted in no loss of life, and in only two cases caused much bodily suffering, and it might be well to take into account the fact that the Pacific Railroad has more locomotives constantly on the track than any other road in the State of Missouri, and carries more passengers.

It may also, perhaps, be claimed that the road-bed or rolling stock is not kept up and that accidents arise from this cause. In answer to this I have to state that the Pacific and all other roads, at least in the West, have been cramped for money, and that while the stockholders in scarcely any instance have received anything on their investment, every dollar of the earnings has gone into them in some shape, and this is emphatically the case with the Missouri Pacific, for not one dollar has been taken out of it by any stockholder. And while the earnings of this road have been large, the expenditures on the road have also been large, and when three years ago the State parted with her lien on the road there was really very little to lean upon, for the road was so run down that it might safely be said it needed not only repairing but rebuilding. This was caused by the fact that up to and during the war no railroad in Missouri was a profitable and hardly self-sustaining investment; and while all they earned was put into them, it was not enough to renew their iron, and hardly enough to keep them in ordinary repair.

In order that the public may know what has been done and spent on the Pacific Railroad in renewals and repairs within the past two years, I will state that in the matter of iron alone there has been spent \$708,000; that there were 92 miles of new iron laid along the line of the road, or nearly one-third of its entire length, 12 miles of which were laid within the last forty days; and that every dollar of the net earnings has been spent on the road except what was necessary to pay the interest on the bonded debt, though this year the expenditures appear more in the shape of material than labor. If there are any who say the company is not doing all it possibly can to maintain the Pacific as a first-class road, facts and figures will not lie, and this company courts any and all investigation at the hands of the State, the courts or individuals. It must be evident to the most superficial observer that it is greatly to the interest of the managers as well as the stockholders of any railroad to do everything in their power to prevent accidents in a strictly financial as well as every other point of view, and if they fail to do so they are not only careless of public interests but of their own.

In conclusion, I have to say that this company believe that the Pacific Railroad is to-day, in point of road-bed and equipment, fully equal to any road of its age in the State, and that it is the determination of its managers not to take a dollar from its earnings until it is fully equal to any road in the United States in point of construction, equipment and facilities generally. But it should be remembered that railroads

have much to contend with, and not the least of which is the disposition of some to throw every obstacle possible in the way of enterprises of this kind, looking upon them merely as soulless corporations, and not as institutions highly necessary, and indispensable indeed to the public interests.

Very respectfully, your obedient servant,

JOSEPH BROWN,
President Pacific Railroad Co.

The Snow Blockade on the Union Pacific.

On the 14th inst. the Union Pacific Company gave the following statement of its experience with the snow blockades this winter, which was telegraphed by the Associated Press, and has been generally published by the newspapers. A few days later several trains from the east passed the blockade and reached Ogden, one of them 28 days from Omaha.

The first blockade on the Union Pacific Railroad the present season occurred on the 12th of October near Rawlins, and since that time, with brief intervals, there has been a succession of snow and wind storms of great violence. The greatest depth of snow on the line of the railroad across the mountains has been caused by drifting and not by falling snow. Three years ago a blockade occurred which lasted nearly twenty-one days; this was before any snow fences or snow sheds had been built. During the following year snow fences and snow sheds were erected on the localities where the road had been obstructed, and at other points where those persons best acquainted with the country and its meteorology thought it desirable for a thorough protection of the road. The summit cuts were shelled, and at various places from one to four lines of snow fences were erected on the northwest side of the road, from which direction it was the experience of mountain men snow storms invariably came. This protection appeared to be ample during two winters next succeeding, although snow storms were numerous, and there was no blockade and but very slight detention of trains. After the first blockade this winter, the three succeeding snow storms came from precisely opposite directions, and against these storms fences afforded no protection whatever. An effort was then made to erect fences on the opposite side of the road, and every available resource of the company was used to procure materials for that purpose. In the shortest possible time large gangs of workmen were employed night and day in the construction of fences at Omaha. When made in sufficient quantities, special trains of snow fence were sent to the proper place for erection, and preference given the coal trains over all others.

In November the second serious blockade occurred, the fences having been found insufficient to arrest the drifting snow. An effort was then made to open the road and keep it open by the use of snow plows, of which the company had thirteen that had proved to be efficient during the past two winters. Three heavy engines were coupled behind the plow, and as a result of this attempt twenty-five locomotives were disabled within one week by being thrown from the track and materially injured. The drifted snow proved to be so dense that it was impossible to force the plow through or into it until after the cut was trenched at intervals of eight or ten feet down to the rails. It then became evident that manual labor must be provided to clear the track, and with all possible dispatch seven snow trains were fitted out, with accommodations on each for sleeping and feeding seventy-five laborers, and with two weeks' supplies of provisions. This force was set at work in addition to the ordinary numbers employed, and it has been only by the aid of these snow trains, followed by plows, that we have been able to send trains over the road. Ranchmen bred on the mountains for the last twenty-five years say that nothing like the present winter has occurred during that time, considering the depth of the snow, duration of the intense cold or violence and frequency of the storms. For such a winter our road is not prepared; but, after an examination, it is thought the road can, during next season, be prepared to pass trains promptly during any future winter of even greater severity than the present, at an expense considerably less than the amount the company has lost during the past three months from the interruption of travel and increased expenditures. One difficulty has been that the road passes through a region destitute of supplies and of labor, and when obstructions occurred, both these were required to be transported over long distances by long-continued working, extra hours and during the intense cold. The men in some cases became disheartened and refused to work. In numerous cases they had frozen limbs and were disabled. Until the weather shall change and these storms cease it is our expectation to run trains over the road by preceding them by snow-train and plow, and also with a train of provisions and coal sufficient for a thirty days' supply. By this means we expect to get trains through in from ten to fifteen days, depending, of course, on the frequency and violence of storms. No trains will be sent out without this supply, and although passengers will necessarily experience the annoyance of detention, it is intended that the supply of fuel and provisions shall be ample for any emergency. There has been no suffering for the want of provisions nor will there be any by the passengers on this road. The road is now open from Omaha to Laramie, a distance of 572 miles, and from Washakie to Ogden, a distance of 272 miles. The obstructions are between Laramie and Washakie, embracing the divide of the continent, being only 176 miles. There are now seven west-bound passenger trains detained near Separation, which is twenty-nine miles distant from the western boundary of the blockade, and there are two east-bound passenger trains at Green River waiting until the western-bound trains shall pass the blockade at various points along the road. There are about eight hundred west-bound cars of freight and about two hundred cars of freight east-bound.

Railroad Patents.

The following patents were issued February 6: For a dumper for railroad tenders, to Thomas C. Hendry, Union Point, Ga.; for a street railroad track-cleaner, to Aaron Higley and Dustin Atwood, Cleveland, O.; for a locomotive engine, to Sidney Skillman, Jersey City, N. J.; for a hinged joint for car seats, to George W. Perry, Newcastle, Del.; for electro magnetic railroad signal and switch-tender, to Hugh S. L. Bryan, Liberty, Mo.; for a method for preserving wood, to Lewis Feuchtwanger, New York; for railroad switch, to Chauncey F. Keller, Upper Sandusky, O.; for car coupling, to Levin Marshall, Mount Sterling, Ill.; for car coupling, to Joseph Davis Riggs, Buckley, Ill.; for railroad-car ventilator, to Henry J. Ruttan, Cobourg, Canada; for railroad tie and chair, to Lucius E. Towne, Brodhead, Wis.; for electrical apparatus for preventing railroad accidents, to Charles Verry and Adrien Veillet, Lille, France.

At the same date patents were re-issued to John T. Bassett, of Galesburg, Ill., for steam-actuated car brake; to John H. Lyon, New York, for seal lock for railroad cars.



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Editorial Announcements.

Address.—The RAILROAD GAZETTE will be printed for the present in New York; our printing house in Chicago having been destroyed. All communications, therefore, whether editorial or business, should be directed to the New York office. The proprietor will receive subscriptions and advertisements at his office in Chicago, Nos. 63 and 65 South Canal street, but letters should be addressed to New York.

Correspondence.—We cordially invite the co-operation of the railroad public in affording us the material for a thorough and worthy railroad paper. Railroad news, annual reports, notices of appointments, resignations, etc., and information concerning improvements will be gratefully received. We make it our business to inform the public concerning the progress of new lines, and are always glad to receive news of them.

Articles.—We desire articles relating to railroads, and, if acceptable, will pay liberally for them. Articles concerning railroad management, engineering, rolling stock and machinery, by men practically acquainted with these subjects, are especially desired.

Inventions.—No charge is made for publishing descriptions of what we consider important and interesting improvements in railroad machinery, rolling stock, etc.; but when engravings are necessary the inventor must supply them.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns our own opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

MR. ADAMS' RAILROAD ESSAYS.*

This volume contains eight essays, all but one of which, we believe, made their first appearance in the *North American Review*, although one of them, and that the most important, has been somewhat modified and elaborated for publication in this volume. Four of these essays are by Mr. Henry Adams, now Professor of History in Harvard College and one of the editors of the *North American Review*. Of these, one is a historical essay, "Captaine John Smith," which explodes the romantic story of the saving of Captain John Smith's life by Pocahontas, a story originally invented by Captain Smith himself, who seems to have been expert in drawing the long bow, so much so, that he invented three or four different tales concerning this passage in his life. The others are on financial subjects, with special reference to the recent financial history of the United States. These are "The New York Gold Conspiracy," "The Bank of England Restriction" and "British Finance in 1816." Another and important financial essay is "The Legal Tender Act," which is the joint production of Mr. Francis A. Walker, the recent Superintendent of Census and present Commissioner of Indian Affairs, and Mr. Henry Adams.

The chief value of the volume to us and our readers, however, lies in the three essays by Charles F. Adams, Jr., one of the Railroad Commissioners of Massachusetts, who, it is well known, has made a special study of the relations of railroads to the State and the tendency of the development of railroad management. One of these essays is "A Chapter of Erie," which probably has done more than anything else to expose the unscrupulousness of a certain class of speculators and the wholesale corruption of legislatures, executives and courts which they have found possible in the pursuit of

their schemes. "An Erie Raid" is a history of the remarkable contest between the Erie and the Albany & Susquehanna managers for the possession of the latter road—a contest which inclines one to believe that anything and everything is possible in New York courts; since all kinds of contradictory orders and decisions were made by these courts in this case. These essays are something of the nature of newspaper articles, in that they treat of topics of the time, which, though of more than temporary interest, were yet most interesting at or near the time when the events they describe occurred. They are indeed important chapters of contemporary history, marking the development of perhaps the most dangerous and certainly the most defiant exhibitions of the power of great modern corporations. They will never be so interesting hereafter as they were when they were first published, doubtless; but their effect, we believe, will not be temporary, even should they cease to be read. If such histories become hardly possible hereafter, it will be largely because these expositions have opened the eyes of the community not only to the practices, but to their inevitable consequences to itself. Simply to give the history of the transactions by which the Erie Railway was secured by its present managers, and, later, of the complicated litigation by which they attempted to take possession of the Albany & Susquehanna Railroad, was a very valuable and not an easy service. The newspapers, which profess to give us the history of the times fully and clearly, and do not often let anything of importance escape them, in this case gave rather disjointed fragments of history than history, leaving scarcely any impression except that of confusion, the connection between the various plots and plans not appearing, and the results seeming to be accidental rather than otherwise. A vast conspiracy, which somehow ended in success, is what we saw, but how the success was related to the visible steps in the plot did not clearly appear. So the careful development of the history, the setting forth of the various steps in their order, and the explanation of their intent and their effect which Mr. Adams has given so clearly and vividly, have made what was before unintelligible quite plain, and the interest of the narrative is something like that of a romance with a regular plot.

The last essay in the volume, entitled "The Railroad System," is somewhat elaborate, and gives at some length the author's deductions from his studies and investigations, which evidently have been extended, varied and severe, and made conscientiously and impartially, with the true scientific spirit—that is, without bias in favor of this or that particular theory or policy, but with the intention to get at the truth as nearly as possible. This has been a striking feature in all Mr. Adams' writings, and is more noticeable in treating on such subjects, where so little is fixed and absolutely determinable, than in what has a basis in exact science. Indeed it is more noticeable than it should be, because it should be universal; but most treatises on subjects of this kind are in the nature of special pleas, in which the facts are gathered for the purpose of sustaining some position, and the position not deduced from the facts.

"The Railroad System" is divided into five chapters, "The Era of Change," "The Transportation Tax," "Railroad Consolidation," "Stock Watering" and "The Government and the railroad corporations." Most of these, as their titles indicate, are chapters in the history of railroad transportation and considerations on its effects on society. Declamation on the influence of railroads is common enough; their effect on the progress and prosperity of any country, and of a new country especially, being unmistakable. But Mr. Adams has looked below the surface and shown that the bringing of producer and consumer together by means of cheap and rapid transportation has had other effects than an increase of production and a consequent increase in prosperity. Other effects of nearness besides the elimination of transportation charges are produced. City and country have become neighbors, distant States are intimately connected and acquainted, and the relations of nations are so close that their interests are much often identical than heretofore. Men know each other better, depend upon each other more, lose national and provincial peculiarities and prejudices, and tend constantly toward a common standard. The progress made toward the true "solidarity of the human race," the interdependence of communities and nations, the harmony born of intimate acquaintance and the consequent destruction of prejudices, has been extraordinary in the past fifty years, and is chiefly due to the improved methods of transportation by land and by water, which have made all men neighbors.

But it is perhaps the account of the internal workings of the railroad system rather than its effects as the great modern instrument of transportation that gives special value to this essay. The laws governing any business

are usually formed slowly by the experience of centuries; but the business of transportation by rail began yesterday, as it were, and has grown to its present vast proportions so fast that it has hardly had time to come under any generally acknowledged rules. What are its special dangers? What special tendencies, needing careful watching, encouragement or check as the case may be, have been developed by it? These are questions which deserve the most careful attention, and will so long as railroads remain what they are, one of the greatest forces in our material civilization.

Some more definite account of Mr. Adams' positions in regard to the relations of the railroads and the community we must postpone until another time; but we will take this occasion to commend this volume to every railroad manager and every citizen who desires to understand the complicated questions of railroad management in its connection with public prosperity, and the extent of the power which the government may exercise over the railroad companies.

BOILER EXPLOSIONS.

It is perhaps fortunate for mankind that the presence of danger soon allays fear. The raw recruit is filled with terror at the first sound of a cannon, and the youth from the rural districts stands appalled at the idea of going "down to the sea in great ships." Most persons unaccustomed to the society of steam engines grow nervous at the sound of escaping steam, and become excited at the idea of riding on a locomotive. It is, of course, very fortunate that these sensations soon disappear, that the veteran learns to take steady aim, the sailor boy's nerves grow steady, and the locomotive runner is calm notwithstanding the exhilaration of riding on his fiery steed.

These feelings of apprehension have their use, however, and when they are overcome should leave, not a spirit of recklessness—as is often the case—but a memory prompting to vigilance and caution. Most of us learn by experience and observation that we are obliged to accept life with all its risks and dangers, and that beyond a few precautionary steps which we can take, we are constantly obliged to encounter risks of danger, disease and death, and too much reflection thereon is not consoling. If, for example, we studied the statistics concerning the people who are hurt or injured by slipping on orange or banana peel in the streets of New York, we might become apprehensive of taking a walk in that city, and strangers who read the police reports assiduously before going there often are in mortal terror of being garroted or otherwise generally demolished whenever they go out at night. Now, it is not our purpose in this article to fill the minds of those who come to New York with apprehension about going out at night—although it might be well, for other reasons, if many who do come here stayed in doors at that time—nor to fill locomotive runners with perpetual dread of a boiler explosion. What is important, however, in view of the great number of locomotive boiler explosions which have occurred recently, and of the great quantity of bad boiler work which is done, and defective boilers which are running, is that those who have the care of them should exercise as much caution as possible, and use every opportunity and means of examining and investigating their condition.

It is, of course, impossible to take off the lagging of a boiler every time the locomotive is in the shop for a day; but it would be advisable to remove it to examine the condition of the boiler oftener than would otherwise be requisite. Every part of the outside of a boiler is accessible for examination, and every master-mechanic should have frequent and thorough examinations made of the condition of the seams, the rivets and the stays. Did we not know the habitual carelessness of human nature with regard to dangers whose existence is not manifest, we would think that persons whose lives are constantly exposed to the danger of an explosion of a boiler would, under these circumstances, exercise constant care and vigilance in examining and knowing its condition. Just the reverse of this is often the case, and most of those who run locomotives hardly give a thought, and never any time or trouble, to the examination of the boilers of their engines. What we wish to impress is, that whenever a locomotive runner has the opportunity he should use it to scrutinize every part, and especially the stays and braces inside. These very frequently become loosened or break. The keys rust off or drop out, the rivets are broken or the crow-feet give way. If a person is in search of amusement, he will not find climbing about the inside of a steam boiler, with a lamp, and examining every square inch of its surface with the greatest care, the most entertaining occupation he has ever engaged in, and for this reason it is so much neglected. With those who must stand behind a boiler if it explodes, there is, however, a sufficient motive to submit to the discomfort of such examination; and if they realized its importance, they would willingly

* Chapters of Erie and other Essays, by Charles F. Adams, Jr., and Henry Adams. Boston: James R. Osgood & Co. 1871.

take the trouble. It is because long immunity from such accidents has given them a sense of security that they grow indifferent and careless. We wish it were possible to use some language strong enough to arouse the indifferent ones to a sense of the tremendous importance of this matter, and we cannot help but feel that possibly one or more human lives may be staked upon the skill with which these few sentences are written, and the force with which the lesson we are trying to inculcate is taught. In previous articles we have tried to show how very imperfect and lamentably defective is most of the boiler work which is now done. It is impossible to reform this in a day or a year. Boilers such as they are must run day after day for a long time, and danger will always hover over them while they are in use. The risks can, however, be lessened by constant and never-ceasing watchfulness, and the man most interested and who has most at stake can always know more about his boiler than any one else. Besides, a locomotive runner often acquires a sort of half-affectionate regard for his engine, and therefore will always be able to detect any flaw quicker than any one else. The master mechanic, foreman or inspector of engines usually has from ten to a hundred locomotives under his charge, and it is not in human nature for any man, nor is there time enough in twenty-four hours per day, for such persons to examine all these locomotives with the same care as each runner or fireman can give it.

To such, therefore, we present the following suggestions:

1. Examine every seam, rivet, stay-bolt and plate on the outside of the boiler as carefully as though you were hunting for a flaw whose location you do not know, but which, you are satisfied, exists somewhere. Give special care and attention to the seams about the junction of the waist to the fire-box.
2. As often as opportunity presents get inside of the boiler, and with a hammer test and examine every brace, stay and crown-bar which is accessible, and as far as possible scrutinize every seam for flaws or fractures, and also examine each plate carefully along the seams to see whether any grooving has commenced where the one plate laps over the other.
3. Never omit to get into and examine the boiler after it has been thoroughly repaired, or after the boiler-makers or others have been at work inside, and see whether they have replaced and fastened all the braces, which they often forget or omit to do.
4. Have the boiler tested frequently with a moderate hydraulic pressure, or a pressure a few pounds higher than the maximum working steam pressure. A slight blow of a hammer will sometimes reveal a flaw, when the boiler is under such a pressure, which would not be perceptible at other times. After the boiler has been subjected to the hydraulic test, if possible examine the braces and stays again to see whether they have stood the pressure.
5. If you have not examined the boiler recently and feel secure, reflect that under the circumstances the sense of security is an element of danger, and therefore examine your boiler at once—or say your prayers—or, better still, do both.

The Texas Pacific Railroad.

When this company was organized last spring, it was given out that it would construct its line rapidly and commence it as soon as the necessary preliminary surveys should be made. The President, Marshall O. Roberts, had large interests in Texas, and it was understood, was ambitious to make the construction of this road the great work of his life. Yet, so far, very little has been done except to secure control of the Southern Pacific Railroad, which extends from Shreveport, La., 66 miles west. Some surveys have been made, but, so far as has been made known, no contracts have been executed and no attempt made to advertise the line or to raise capital for its construction, although the year has been one of the most favorable for obtaining money for railroads. There have been reports that Mr. Roberts met with a powerful opposition, in the face of which he did not think it advisable to go on; and, as he has a reputation as a very capable and trustworthy business man, it is probable that the obstacles, whatever they may have been, were not imaginary.

On the 16th inst., Mr. Roberts resigned his position as President of the company, and Mr. Thomas A. Scott, President of the Union Pacific, etc., was chosen his successor by a unanimous vote of the board of directors. Mr. Scott, it is known, is interested in a corporation which has secured leases of numerous Southern lines, which will altogether form nearly a complete line to Louisiana at least, if not to Texas. He will, therefore, be able to make the traffic of the proposed new road valuable to him and his associates before it has reached, or after it has left, the eastern terminus of that road.

It is understood that Mr. Scott will withdraw from the Union Pacific at the close of his present term (next month), and will thus be free to engage in the promotion of the Texas line without incurring the jealousy of the owners of the Union Pacific, whose representative he now is. It is doubtless for the interest of the Union Pacific that a new line should not be constructed across the continent, so long as it has abundant capacity for all the Pacific traffic, as it now has; but if a new road is to be constructed, it will be an advantage to the Union Pacific if that new line can be controlled by its officer, provided, of course, that he does not unduly favor the latter.

It seems to be taken for granted that the Texas Pacific road will now be undertaken with vigor and completed rapidly. It is altogether probable that if the company desires to complete the line—at least a considerable portion of it, including nearly all that in Texas—it will have little difficulty in finding the capital.

The probability of the construction of the line will give a special interest to a series of papers describing the route from the Red River to the Pacific, which have been prepared for our columns by a gentleman practiced in observation and description, who has traveled over the entire line. The first of these papers will be found on another page.

Alabama Railroads and the State Subsidies.

In the present condition of the human race, as it exists in America, probably we may take it for granted that when a State makes a standing offer of \$16,000 per mile of its bonds for every mile of railroad that may be constructed within its territory, there will be some swindling. This might be looked for in the most intelligent, virtuous and best-governed communities; and, whatever else may be said of Alabama, it doubtless cannot be truly said that for some years after the war it was one of the "best-governed" communities; and there are not wanting those who would substitute another and very different superlative for "best," and then insist that they did not exceed the truth. The one unmistakable result of the Alabama law was a vast increase in the debt for which the State is liable. The State did not give its own bonds to the railroad companies, but it endorsed theirs, with the result, usual in such cases, that it is likely to be called upon to pay interest and principal in nearly every case.

The State Legislature appointed a committee of investigation, which has recently made a report, giving a very bad showing for the railroad companies which have had their bonds indorsed by the State. Nine of these have had their bonds indorsed to the aggregate amount of \$13,600,000, and the State has loaned its own bonds to three of them to the amount of \$2,620,000. The completion of these roads would involve a guarantee of a further issue of \$17,822,000.

The State endowment should have secured the completion of 850 miles of railroad, but there is not even a pretence that so much has been constructed, the executive officer apparently accepting the "certificate" of the railroad officer as to the miles completed, and the railroad officer adapting his figures rather to the wants of the company than to the engineer's measurements; or, perhaps, measurements were neglected, and a "guess" was made of the mileage. But this was not all, and perhaps not the worst; for the lines on which rails have been actually laid in many cases do not deserve the name of railroads, and could not be operated even with the light traffic and moderate speed usual on Southern roads with any degree of safety. The provisions of the law as to the character of the roads whose bonds it guaranteed seem to have been looked upon as a dead letter, and the guarantee was claimed, and generally obtained, for anything which had two parallel bars of iron, however light, upon any apology for a road-bed. A requirement that the first twenty miles should be completed from the resources of the company independent of the State guarantee was also generally neglected.

Most of the lines so aided by the State remain uncompleted. Some of them are likely to be valuable if put into good order and well equipped, but there is such a thing as paying too dear for a whistle, even if it is a good whistle.

NEW PUBLICATIONS.

American Locomotive Engineering and Railway Mechanism: By G. Weissenborn, Mechanical Engineer. (New York: American Industrial Publishing Company.)

We have received the first two numbers of this work, which will be issued in parts uniform in size and style with the other engineering publications by the same author. These, it will be remembered by some of our readers, consisted of large plates 15x24 inches. "Locomotive engineering" is of the same size, and the numbers before us contain nine lithographs of this kind. The first, which we suppose is intended for a vignette to the work when bound, represents a side elevation and rear end view of a locomotive built at the New Jersey Railroad & Transportation Company's works in Jersey City. The next is marked plate I and is the same engine in outline, with the dimensions and reference letters marked all over it. Plate II is a longitudinal section, with half-transverse sections through the smoke and fire-box. Plate III consists of details. Plate IV is a skeleton view and plan, also figured and lettered. Plate V is filled with details. Plate VI is a detailed drawing of the boiler. Plate VII shows the manner of laying off the sheets for the boiler and smoke-stack. Plate VIII is a detailed drawing of the truck, driving-wheel and box, and throttle lever. All these plates are drawn in the very best style. The execution is not only admirable, but the drawing is so complete as to represent every part very perfectly; and the details would answer for working drawings. We can say without hesitation that they are the best engravings which have ever been published of American locomotives, and we know of none of European engines which are so complete and which represent so perfectly the details of every part. We find but one point in which they are open to criticism. In some of them the draftsman has neglected to cross-line or "hatch" the sections. This would have made them much clearer and taken away that appearance of vagueness which this omission always produces. In plate II this is most marked.

The first part, besides the plates referred to, contained eight large quarto pages of text, including the title page and introduction. We believe it is intended to supply a similar amount of text with each number, but by accident it was omitted from the second part which we received.

Of the text we regret not being able to speak quite so favorably as of the illustrations. It is evidently written by a person more accustomed to handling a drawing pen than a goose quill. There is an abruptness and often a want of consecutiveness about it which produces at times a peculiar effect, as, for example, in the opening sentence, and that which succeeds it. The language is also at times indefinite, as in the following sentence: "The assumptions in regard to ratios existing between one part of the engine and another, between the fuel consumed and the steam generated, and other points of more or less import, have been carried to great lengths." It will puzzle most readers, we think, to unravel the meaning of such a tangle. Of course the object of a book of this kind is primarily the communication of knowledge, and even though it may not be expressed in the clearest language, yet if a writer gives the desired intellectual food, most readers will find but little fault with the way it is served.

There is a good deal of internal evidence to indicate that the writer's experience has been more of a practical than a literary character, as for example in this choice bit of common sense, which every reader who has observed the influence of both theoretical and practical training will recognize at once as an expression of his own experience and observation:

"The knowledge acquired in the machine shop by the student will, when he comes to take his place at the drawing-board in the draughting department, make itself manifest in a multitude of important details, of which otherwise he would have no conception. Of course it is obvious that the end to be accomplished in a steam engine is that it should operate perfectly by steam. Now the student who had received no practical instruction would be very apt to design a machine possessing many elements of beauty and ingenuity, and defective only for the reason that it would not work. The misplacing or omission of some small and apparently insignificant part of the machinery would make it utterly worthless. But a youth who had mastered the engine in its constructive details, and who knew the function of every part of the complicated mechanism, would not overlook the slightest defect; his educated eye would in a moment detect any trifling error in construction, and under his practical hand the machine would receive the last finishing touches of grace, stability and operative function."

It is of course impossible to judge of the character of the text from the introduction alone; but if the author undertakes to treat comprehensively all the subjects which he has included in his plan for the book, it will require a lifetime to complete it. The subjects which he proposes to "treat explicitly" are metallurgy, strength of materials, heat and steam, "observations upon combustible action in the sun, the chemical constitution of water and the nature of hydrogen and oxygen," the mechanical equivalent of heat, the nature of combustion, the construction of furnaces and boilers, "the fullest and most minute instruction in all that relates to mechanical drawing," the construction, repairing and management of locomotives.

A comprehensive work on all these subjects would, of course, be extremely valuable to engineers; but we think that any one who has an adequate knowledge of the extent of the field which the author has undertaken to cultivate must realize that it will be impossible for one person to plow deep with such long furrows and so many of them. If our author would confine his work to simply illustrating and describing "the construction, repair and management of locomotives," he would have enough room to make his book more valuable to engineers and railroad men than any similar work of its kind.

We cannot, however, speak too highly of the lithographic plates with which the book is illustrated, and they alone are certainly worth the price charged (\$1) for each part. Not the least merit of these plates is their correctness, and in the details all the important dimensions are given, and the whole shown with a clearness which we have never seen surpassed and seldom equaled. If Mr. Weissenborn carries out his plan by simply supplying illustrations of this kind to subscribers, he will be doing a good work, and one which deserves to be liberally encouraged by railroad men and engineers generally.

A Great Traveler.

During the twelve years of his connection with the railroad transportation business, Mr. Charles W. Poulson, it is represented, has traveled 896,000 miles, nearly enough to make two "round trips" to the moon.

General Railroad News.

CHICAGO RAILROAD NEWS.

Michigan Central.

All the railroad lines entering the city will enlarge their facilities for freight transportation so as to meet the increased demands of the city for building material during the coming season. The Michigan Central has already determined to put four extra trains on their road as soon as the building season fairly begins. These trains will be devoted chiefly to the transportation of lumber and brick from various points in Michigan to this city, and will generally be made up at a point 15 or 20 miles west of Michigan City.

Chicago, Burlington & Quincy.

This company commenced last week to lay track on the Prophetstown extension. The grading is nearly all done between Prophetstown and Clinton, and the track is to be laid so as to have the road ready for the transaction of the spring business.

Large quantities of freight are offered on this road, in the line of dressed hogs and grain, that the company are obliged to refuse, at present, owing to the fact that it cannot be shipped eastward promptly, and the warehouse room of Chicago was all absorbed some time ago. The opening of navigation will set everything free again, and is looked forward to as a regulator of the transportation business of the roads entering this city from the west and north.

At the company's shops in Aurora will soon be completed two parlor cars for the Pullman Palace Car Company, to be called the "Venus" and "Mercury," which are said to exceed in elegance, if that is possible, the finest of the many magnificent cars which this company has running. The cost is stated at "about \$40,000" each, which would pay for six ordinary passenger cars. The Burlington Company is also building for its own use at these shops three unusually fine day cars with a new heating and ventilating apparatus.

The company announces a semi-annual dividend of 5 per cent, payable March 15.

Chicago & Alton.

This railroad's earnings for the second week in February show a decided falling off from the earnings for the corresponding period last year. This falling off is readily accounted for from the fact that the Mississippi has been so obstructed with ice as to make it practically impossible to transfer freight across it. The following are the figures for the second week of February: 1872, \$85,473.12; 1871, \$99,071.83; decrease, \$13,598.70, or 13½ per cent.

The following is a statement of the earnings of the road for the year 1871:

January.....	\$353,235 43	August.....	\$534,162 66
February.....	342,368 54	September.....	507,616 92
March.....	384,998 76	October.....	473,237 17
April.....	398,964 04	November.....	45,607 52
May.....	461,289 91	December.....	377,636 93
June.....	466,091 32		
July.....	533,654 98	Total.....	\$5,278,910 23

The receipts of this same road for the year 1870 were \$4,849,404.89, showing an increase of \$429,405.34 for the year 1871.

This company has reason to congratulate itself and its patrons in being able to boast that it has carried a million of passengers without injuring one of them.

The company is preparing to get its full share of the Texas cattle trade from Kansas City and elsewhere, and is now constructing a car to run with stock trains for the express accommodation of the stockmen who travel with the cattle, and who usually are glad to find shelter in an ordinary "caboose."

These cars are unusually long, and are provided with bunks which can be turned up by day to serve as tables, have cushioned seats, provision for washing, and altogether afford a comfortable place for a civilized man to live while on the comparatively long journey which a stock train makes.

Mr. Blackstone, the President, has recently closed a contract with the Schenectady Works for twenty new locomotives, to be delivered the coming spring.

Chicago & Northwestern.

On Saturday last, Mr. M. Hughitt, formerly Superintendent of the Illinois Central Railroad, and more recently Superintendent of the Pullman Palace Car Company, accepted the office, which had been tendered him a few days before, of General Superintendent of the Chicago & Northwestern Railway, vice John C. Gault, resigned. The appointment to take effect on the first day of March. Mr. Hughitt has risen from the ranks, having been a telegraph operator on the Chicago & Alton road a few years ago; then he became Train Master of the same road, and subsequently accepted a similar position from the Illinois Central, where he rose to the position of Assistant Superintendent, and on the resignation of W. R. Arthur, a few years ago, he was chosen General Superintendent. About a year and a half ago he accepted the office of Assistant General Manager of the Milwaukee & St. Paul road, which position he resigned to take the general superintendence of the Pullman Car Company.

Mr. Gault is still absent in New York. It has not yet transpired as to what is to be his next field of operations, although rumor everywhere says he is not to leave Chicago. He is universally acknowledged to be one of the best railroad men that the West has ever produced.

The Dodge County (Wis.) Democrat gives the following account of the proposed line of this company from a point north of Madison, Wis., to Milwaukee: "The line now surveyed starts at the terminus of the road at Milwaukee, passing northwest until the La Crosse road is crossed, when a western direction is taken, the new line averaging about two miles north of the old road, until it reaches Iron Ridge, when it gradually diverges southward so as to strike the Northwestern road at the depot in Juneau, whence it is supposed the line will run west to South Beaver Dam, thence to Fall River and thence to Lodi."

New Routes into the City.

The Committee on Railroads of the Common Council

have nearly perfected the ordinance for the admission of the Chicago & La Salle Railroad into the city. So far as the location of the right of way in the west division is concerned, the committee have agreed upon the following:

"That permission and authority be and the same are hereby given and granted unto the La Salle & Chicago Railroad Company to lay down, maintain and operate one or more railroad tracks along and upon the following-named route and streets in the city of Chicago, to wit: Commencing at the western city limits adjacent to the right of way of the Chicago, Burlington & Quincy Railroad Company; thence as near as practicable to the said Chicago, Burlington & Quincy Railroad tracks to Rebecca street; thence on Rebecca street to or near the east end of Rebecca street; thence to Meagher street; thence on Meagher street (and on the alleys between Johnson and Halsted streets running on a line nearly due west of Meagher street); also, along on Stewart avenue and Beach street; also to and across the South Branch of the Chicago River."

The committee has not yet decided upon the route they will recommend for the road in the South Division. The company seek to have their terminus not far from the present Michigan Southern passenger depot grounds. The ordinance, as drawn, provides that the cars shall be moved in the South Division by horse.

The following section in the ordinance adopted by the committee relates to the proposed depression of the tracks of the road in the West Division:

"The said railroad company shall have the right, and is hereby authorized, on its route west of the South Branch of the Chicago River, to depress its tracks, to bridge the cross streets over said tracks, and to employ such other means as to such cross streets as it may deem necessary to secure quick transit; all of said work to be done under the direction and superintendence of the Board of Public Works of the city of Chicago, and all bridges, when so erected, with the approaches thereto, shall belong to and be the property of the city of Chicago."

The right is to be granted upon the express condition that the Chicago & La Salle Company shall permit any other railroad companies, not exceeding two, not at present having the right of entrance into the city, to use the tracks jointly, upon such terms as may be agreed upon by the companies; or, in case they cannot agree upon the terms, they are to be submitted to a board of arbitration.

It is quite likely that this ordinance, of which the above extracts form the substance, will be passed by the Common Council within a short time.

Illinois Central.

The company reports as follows its receipts for January:

Land Department.			
Acres construction lands sold.....	3,974 76	for	\$24,685 06
Acres free lands sold.....	362 00	for	5,984 80
Total sales during the month January, '72.....	3,266 76	for	\$30,000 00
Cash collected in January, 1872.....			\$101,158 15
Estimated Earnings—Traffic Department.			
In Illinois.....		402 miles.	Total.
Freight.....	\$394,172 00	\$43,267 00	\$437,439 00
Passengers.....	100,551 55	24,075 50	124,627 05
Mails.....	6,375 00	3,049 38	9,424 38
Other sources.....	69,645 00	1,340 67	70,985 67
Total, January, 1872.....	\$570,733 55	\$71,732 50	\$642,466 05
Total actual earnings January, 1871.....	\$538,271 27	\$79,793 71	\$618,064 98
Inc. \$32,462 28	Dec. \$3,061 21	Inc. \$21,401 07	

This is an increase of 6 per cent. on the Illinois lines, a decrease of 10 per cent. on the Iowa line, and an increase of 4 per cent. in the entire traffic.

Personal.

A few days since, Mr. John R. Bennett, Superintendent of the Pullman Palace Car Company, was made the recipient of a beautiful and valuable dressing-case from the employees of the company, as a testimonial of their respect and good wishes.

A Chicago paper started the rumor that Mr. C. C. Wheeler, General Freight Agent of the Chicago & Northwestern Railway, had resigned his office to enable him to accept the Presidency of the Milwaukee Insurance Company. Inquiry demonstrates the rumor to be entirely baseless.

ELECTIONS AND APPOINTMENTS.

—It is reported that Mr. J. D. Barton, Superintendent of the Long Island Railroad, has been appointed Superintendent of the United States Rolling Stock Company.

—The following officers of the New London Northern Railroad Company were elected on Wednesday, the 7th inst.: President, A. N. Ramsdell; Treasurer, Robert Colt, Jr.; Superintendent, George A. Merrill; Directors, A. N. Ramsdell, Henry P. Haven, Wm. W. Billings, Wm. H. Barnes, Benj. Stark, Aug. Brandegee, Robert Colt, Jr., all of New London; Chas. Osgood, Norwich; William H. Hill, Boston; William Allen Butler and Charles F. Davenport, of New York.

—The stockholders of the St. Joseph Bridge Building Company held their first annual election which resulted as follows: Willard P. Hall, President; Jeff Chandler, Vice-President; Robert Gunn, Secretary; G. H. Coch, Treasurer; J. S. Bittinger, Auditor; Wm. C. Ransom, J. D. McNeeley, John Pinger, F. W. Smith, Sr., R. H. Jourdan, P. G. Conlisk, T. B. Weakley and P. Hyde, Directors.

—D. Willis James, M. K. Jesup, John Crerar, Samuel A. Strong, of New York; and John P. Farley, of Dubuque, were re-elected directors of the Dubuque Southwestern Railway Company on the 13th inst.

—At a meeting of the stockholders of the Dubuque & Sioux City Railroad Company held in Dubuque on the 13th inst., the following board of directors was elected: M. K. Jesup, Isaac H. Knox, D. Willis James, James F. Slater, Frederick Schuchardt. The following hold over another year: Abram S. Hewett, J. Pierpont Morgan,

Lorenzo Blackstone and James A. Roosevelt. The only change from the directory chosen a year ago is the substitution of Frederick Schuchardt for Walter H. Burns.

—Col. Fleming Gardner has been appointed Chief Engineer of the Jacksonville, Pensacola & Mobile Railroad.

—The annual meeting of the stockholders of the Naugatuck Railroad Company was held Tuesday, February 20, at which the following officers were elected:

Directors—W. D. Bishop, R. Tomlinson, E. F. Bishop, Bridgeport, Ct.; Green Kendrick, Waterbury, Ct.; A. L. Dennis, Newark, N. J.; N. A. Baldwin, Milford, Ct.; J. B. Robertson, New Haven, Ct.; J. G. Wetmore, Winsted, Ct.; R. M. Bassett, Derby, Ct.; President, E. F. Bishop, Bridgeport, Ct.; Secretary and Treasurer, Horace Nichols, Bridgeport, Ct.; Superintendent, George W. Beach, Waterbury, Ct.

—The Eastern Railroad stockholders have elected the following board of directors: Samuel Hooper, of Boston; Franklin Haven, of Boston; John Wooldredge, of Lynn; Thornton K. Lothrop, of Boston; Henry L. Williams, of Salem; Ichabod Goodwin, of Portsmouth; Benjamin F. Stevens, of Boston. In this board John Wooldredge and Benjamin F. Stevens succeeded George M. Brown and Benjamin E. Bates, of Boston.

—At the annual meeting of the Pennsylvania Canal Company in Philadelphia on the 13th inst., the following gentlemen were elected directors for 1872: President, Isaac J. Wistar; Directors, J. Elgar Thomson, Thomas A. Scott, H. J. Lombard, G. B. Roberts, Samuel T. Bodine, Wistar Morris, Washington Butcher, Jos. B. Myers, Josiah Bacon, William Anspach, Joseph H. Dulles, Charles Parrish.

—At the annual meeting of the Sunbury & Lewistown Railroad Company, held in Selins Grove, Pa., the following directors were chosen: President, Edmund Smith; Directors: Wm. Painter, D. R. Walker, James M. Sellers, Alex. K. McClure, Philadelphia; Aaron K. Gift, Middleburg, Pa.; Andrew Reed, Lewistown, Pa.; Wm. F. Wagenseller, Selins Grove, Pa.

—At the annual meeting on the 14th inst. of the Atlantic & Gulf Railroad Company, in Savannah, the old board of directors were re-elected, viz.: John Screven, John Stoddard, W. H. Wiltberger, Hiram Roberts, Wm. Duncan, R. D. Arnold, Charles Green, E. C. Anderson, Octavius Cohen, J. L. Villalunga and A. M. Sloan, Savannah, Ga.; J. W. Spain, Brooks County, Ga.; A. T. McIntyre, Thomas County, Ga.; C. J. Mannerlyn and W. O. Fleming, Decatur County, Ga.

PERSONAL.

—The report that Governor J. Gregory Smith is to make room for Wm. G. Morehead in the presidency of the Northern Pacific is indignantly denied.

—Mr. C. H. Hallock, for some time agent in Chicago for the Union and Central Pacific railroads, is about to remove to Denver, where he will have charge of the freight business from that point via the Denver and Union Pacific roads.

—Mr. L. G. Tillotson, well known among railroad men as one of the most extensive and enterprising dealers in railroad and telegraph supplies, sailed for Europe on the 17th inst. On the Thursday evening previous a party of Mr. Tillotson's friends gave him a farewell dinner at the St. Nicholas Hotel, at which numerous railroad men, railroad supply men and journalists were present, and general good feeling prevailed.

TRAFFIC AND EARNINGS.

—The receipts of the Grand Trunk for the week ending January 27 were: 1872, \$33,300; 1871, \$27,600; increase, \$5,700, or 24½ per cent.

—The earnings of the North Missouri Railroad were for the months of

	1871.	1870.	Inc.	Dec.
September.....	\$344,338	\$361,690		\$17,352
October.....	295,841	228,240		67,601
November.....	279,508	266,836		12,672
December.....	244,065	255,735		11,661

—The following are the earnings of the Union Pacific Railroad for the month of December:

	1871.	1870.
Gross earnings.....	\$525,000	\$505,071
Expenses.....	\$350,000	293,796
Net earnings.....	\$175,000	\$211,275

*Estimated for 4th week of December.

—The following earnings are reported for the first week of February:

	1872.	1871.	Inc.	Per cent.
Toledo, Wabash & Western.....	\$95,438	\$95,364	\$74	.08
Lake Shore & Michigan So.....	261,859	265,829	\$3,961	1.5
Missouri Pacific.....	52,515	52,261	254	.5

—The receipts of the Grand Trunk Railway for the week ending February 3 were: 1872, \$30,400; 1871, \$27,600; increase, \$2,800, or 10 per cent.

—The receipts of the Great Western Railway of Canada for the week ending February 2 were: 1872, \$16,359; 1871, \$17,533; decrease, \$1,174, or 6½ per cent.

OLD AND NEW ROADS.

Winterset Railroad.

It is reported that work is so far advanced on this Iowa railroad that trains will be run into Winterset by the first of March.

Davenport & St. Paul.

It is reported that this company, having negotiated \$3,000,000 of its bonds, is prepared to extend its line from the present terminus near Monticello, on the Dubuque Southwestern, northwestward to Fayette, Iowa, about 70 miles, by midsummer. From Monticello it will use three or four miles of the Southwestern track. In connection

with the Southwestern it will give a favorable all-rail route from Dubuque to Davenport.

Chicago & Rock River.

Regular passenger trains have commenced running on the recently completed section of this road between Rock Falls and Amboy, connecting at the latter place with the Illinois Central.

St. Louis, Kansas City & Northern.

The President of this new company, Mr. T. B. Blackstone, issued the following general order from St. Louis, under date of February 12, 1872:

"The St. Louis, Kansas City & Northern Railway Company having on the 6th day of February, 1872, purchased the property heretofore known as the North Missouri Railroad, and taken possession of the same, said road will hereafter be known as the 'St. Louis, Kansas City & Northern Railway.'"

"The general officers heretofore in charge of the property, under the management of M. K. Jesup, Trustee, have assumed the charge of their respective duties on behalf of this company, and will continue the same until further notice."

St. Louis & Kansas Southern.

The line of this road is from Dayton, Mo., on the Atlantic & Pacific Railroad, westward through Baxter Springs and Chetopa, Kan., and further west for a distance of 90 miles. The company proposes also to construct a line from Dayton south to Fort Smith, Ark. The engineer informs us that the company's bonds have been negotiated and the contract for construction let to Riley & Co., of St. Louis. J. S. Clark is President; Col. G. H. Grealy, Vice-President; Dr. W. B. Robertson, Treasurer; N. C. McClure, Secretary; Thomas A. Short, Superintendent; and J. M. Dunlap, Engineer.

Gulf, Western Texas & Pacific.

This company's bond for \$100,000 was filed on the 3d inst. with the Clerk of the District Court in San Antonio, Texas. This is to be forfeited to the county if the road is not completed within two years.

Jacksonville, Pensacola & Mobile.

A line of steamers is to run on the Chattahoochee River between Columbus, Ga., and Chattahoochee, Fla., to connect with this road, which has recently been completed to this point. This will then enable the road to secure cotton from a large section of southeastern Alabama and southwestern Georgia.

Hannibal & St. Joseph.

At the morning call of the New York Stock Exchange on the 16th, the President announced the decision of the Governing Committee in resolutions which expressed that the selection of the place of registry of this company (the Tenth National Bank) was not satisfactory to the Governing Committee, and that the new issue of the company's stock will not be dealt in by the Exchange until after 30 days' notice of the issue has been given and a satisfactory registry established, and that meanwhile only certificates countersigned by the old transfer agents, Duncan, Sherman & Co., will be a good delivery.

Representatives of the company urge that the issue of new stock was authorized by a special act of the Missouri Legislature in March, 1869, and that the old directory, by a vote passed a year ago, also authorized it. But the rule of the Stock Exchange is intended to protect its members, and requires that 30 days' formal notice shall be given in the newspapers and in writing to the President of the Exchange of any increase, so that those dealing in shares may know the amount and not be deceived as to the quantity on the market.

St. Louis, Alton & Terre Haute.

The bondholders, at a meeting held on Saturday, the 17th inst., agreed to the proposed dividend of 14 per cent. in preferred stock on the preferred stock of the company. This was for arrears of 1869 and 1870, and was submitted to the bondholders for their consent by the preferred stockholders at a meeting held January 10, 1872. The option of accepting 7 per cent. in preferred stock for the year 1871 was also given to the preferred stockholders.

Warren & Venango.

The Titusville Herald, February 15, says: Considerable feeling was excited in business circles last evening at the receipt of a New York dispatch, from F. W. Mitchell to D. H. Mitchell, stating that "the sale of the Warren & Venango Railroad will be completed to-day" (yesterday). But at a later hour we were shown a dispatch from Colonel J. Condit Smith, in response to a private message sent him about noon yesterday, assuring him the requisite subscription would be forthcoming. He replies: "I believe the railroad will be built. Scott, Wright and Pitcairn are here. To-morrow will decide."

Naugatuck Railroad.

The annual report of the President and directors of the Naugatuck Railroad Company states that the income for the year ending December 31, 1871, was \$624,761.86, and the net gain, after deducting all expenditures, taxes, interest, &c., \$202,978.21, which is nearly 11 per cent. on the capital stock. The entire capital account is \$1,984,900, of which \$1,872,400 is stock and the remainder mortgage bonds. This is at the rate of \$32,015 per mile of road. So the financial condition of the property must be considered very healthy.

This road runs from Bridgeport, Conn., following the line of the Naugatuck River most of the way, to Winsted, Conn., a distance of 62 miles. Its depots, buildings and shop, at the former place, are located on docks and piers built for its use, from which steamboats bound for New York arrive and depart daily, and where 800 tons of coal can be discharged from vessels daily. The road-bed is reported in first-class order, having over twenty miles of steel rails already laid and more to put down the coming summer. Its passenger and freight cars are reported excellent in design and in the best condition, and its motive power also. Two through passenger, two freight trains and one short mixed train are run daily. The company have a lease for five years of a six-mile branch from Waterbury to Watertown, on which two

passenger trains are run daily. A branch is projected from Seymour to Woodbury, a distance of 13 miles.

Minneapolis, Rochester & La Crosse.

This is a new Minnesota company recently incorporated.

The names of the incorporators are as follows: Henry T. Welles, William D. Washburn, Rufus J. Baldwin, Levi Butler, W. P. Westfall, W. P. Aukency, Josiah Thompson, Minneapolis; W. W. Eastman, John S. Pillsbury, St. Anthony; Charles H. Chadbourn, J. V. Daniels, Hiram T. Horton, Henry E. Mellen, J. D. Ostrom, J. B. Clark, Rochester. The following named gentlemen constitute the first Board of Directors: Henry T. Welles, William D. Washburn, Levi Butler, Rufus J. Baldwin, W. W. Eastman, W. P. Westfall, Hiram T. Horton, J. V. Daniels, Charles H. Chadbourn. This road is projected to Rochester from St. Paul, thence south to form a junction with the Southern Minnesota to La Crosse.

St. Louis, Kansas City & Northern.

One of the new locomotives ordered for this road at the Schenectady Works has lately been received. It has 17x24 in. cylinders, and weighs 38 tons.

Chicago, Clinton & Dubuque.

The Dubuque Herald reports that this company will not only complete its road to Clinton this season, but will also attempt to extend it down the Mississippi from Clinton to Burlington, which is a distance of about 100 miles. We have understood that the company would make its connection with Burlington by using the Iowa Southwestern from Clinton to Iowa City and the Burlington, Cedar Rapids & Minnesota thence to Burlington, a somewhat longer line, but not requiring any expenditure for construction.

Chicago, Dubuque & Minnesota.

There is talk of constructing a branch of this road from Harper's Ferry, 12 miles above McGregor, west by north a little more than 30 miles to Decorah, the county seat of Winnebago County, which is now connected with the Milwaukee & St. Paul road by a branch from Conover. The proposed branch would be nearly parallel with the Milwaukee & St. Paul road and 13 or 15 miles north of it. Engineers are making a preliminary survey.

Milwaukee & St. Paul.

A strong effort is being made to secure the extension of the Southern Division of this road from Monroe to Dubuque. The company has agreed to make the extension if local aid to the amount of \$250,000 is raised. Of this amount \$200,000 has been subscribed. It is reported that a proposition to extend the Northwestern from Freeport to Monroe, and to have the line between Monroe and Dubuque owned and used in common by this and the Milwaukee Company has been considered.

St. Clair Tunnel.

Michigan papers report that some preliminary observations and surveys are making at St. Clair to ascertain the practicability of a tunnel at that point to connect the proposed Michigan Midland with the Canada Southern. The prospect is that the only formidable obstacle will be the cost.

Hoosac Tunnel.

The contractors for completing this work—Shanley Brothers, of Montreal—have applied to the Massachusetts Legislature for a reduction in the amount withheld from them by the State until the completion of their contract. They claim that the necessary machinery and plant which they have supplied was much greater than was anticipated, and that unforeseen circumstances, such as the great storm of October, 1869, which delayed the work a month, and destroyed railroad communication at the east end for nine months, the failure of water power sufficient to run the machinery, have delayed the work and necessitated extraordinary expenditures. The amount earned hitherto is \$2,059,971, of which \$1,559,971 has been paid.

The Advisory Engineer, Mr. Edward S. Philbrick, testified that 2,501 feet remain to be tunneled between the central shaft and the eastern approach, which may be completed next fall if no more water is encountered. He thought the work west of the shaft might be completed in about three years. He thought the headings were advanced satisfactorily, but complained that the tunnel was not finished up as it progressed, a work which cannot be done after traffic has commenced. The contractors assert that if the amount desired is paid they will be enabled to increase their facilities for working so that three or four months' time may be saved in completing the whole work.

Danville & Tuscola.

Efforts are making to secure the construction of a railroad from Danville, Ill. (the junction of the Chicago, Danville & Vincennes, the Toledo, Wabash & Western, and the Indianapolis, Bloomington & Western roads), southwest about 45 miles to Tuscola, which is on the Illinois Central twelve miles south of the Wabash crossing at Tolono. It would nowhere be more distant from the Wabash road, and if the Indiana & Illinois Central shall be built, it will make a sharp angle with that at Tuscola.

Danville & Paris.

The Paris Bude says: "A large number of ties have already been delivered on this end of the Paris & Danville Railroad, and a great many more are delivered daily. The earthwork from Stage's to near Ridge Farm has been contracted to Messrs. Sykes & Wilmoth, and from that point to where the work has already been done, to David D. Huston."

It is intended to have this line completed by next fall. It will form substantially an extension of the Chicago, Danville & Vincennes road.

Central of New Jersey.

A majority of the stock of the Honey Brook Coal Company has passed to trustees for the use of the above company. The coal company has a capital of \$3,000,000 and owns 8,000 acres.

West Fairlee Railroad.

This Vermont railroad company has organized with the choice of these directors: Stephen Thomas and Alvah Bean, of West Fairlee; S. M. Gleason, J. H. Worthen, of Thetford; Moses Spear, of Vershire; H. A. White, of Washington, and John A. Tenney, of Corinth. The town has voted by ballot to bond itself to the amount of \$115,000, but a majority of the property owners according to valuation is also required.

Cairo & Vincennes.

Mr. Fauntleroy, Engineer of the company, furnishes the following facts relating to the progress and prospects of the road:

"Messrs. Winslow & Wilson have agreed to have the road finished and in operation by November 1, 1872, and active preparation is being made to prosecute the work with the greatest vigor. A part of the road was graded several years ago, but will require to be gone over. The old grading is abandoned from Vincennes to a point about nine miles south, and a new location made crossing the Wabash eight miles from Vincennes. The bridge at that point will be 2,800 feet in length, including the pile bridging on approaches. The truss will be 720 feet in length, including a pivot draw span of 240 feet, the whole resting on six piers. Work on the tunnel in Johnson County, Illinois, is already begun; it will be about 1,000 feet in length. A telegraph line will be put up from Cairo to Vincennes in 90 days, and the track laid from Carmi, Illinois, the crossing of the St. Louis & Southern Railway, to the Wabash, fifty miles, by June 1."

Northern Pacific.

The La Crosse (Wis.) Democrat says that an immense contract has been let by this company to C. C. & E. G. Smith, of La Crosse, for constructing the great docks at Duluth. It will require 20,000 piles, 12,000,000 feet of lumber, besides stone and iron.

Leavenworth & Topeka.

Fifty citizens of Leavenworth have subscribed to the stock of this company, and Leavenworth, Shawnee and Jefferson counties will be asked each for \$150,000 in its aid. If this shall be secured it is proposed to offer the franchise to the Atchison, Topeka & Santa Fe Railway Company, on condition that it build the road by the 1st of September next. If not accepted by it, the same offer will be made to any other long line of road that will build it and operate it within the shortest time.

Sheboygan & Fond du Lac.

Concerning this road a correspondent writes that regular trains are running on the extension to Ripon, and in a few weeks trains will probably run through between Fond du Lac and Milwaukee, passing over the Milwaukee & Northern from Milwaukee to Plymouth, and thence over the Sheboygan & Fond du Lac.

Davenport & St. Paul.

The President of this company promises Rochester, Minn., to complete the road through that place to St. Paul within two years, if it shall vote aid to the amount of \$100,000.

Lexington, Lake & Gulf.

Fort Scott has voted \$25,000 to secure the construction of an extension of this road (which as yet has no iron down) from Butler, Mo., southwest to Fort Scott, about 37 miles.

Topeka, Fort Scott & Memphis.

This company proposes to construct a narrow-gauge railroad from Topeka, Kan., southwest through Ottawa and Fort Scott to Memphis, and in aid of it Bourbon County, in which Fort Scott is situated, voted on the 13th inst. a subscription of \$150,000. Saxton & Co., of Philadelphia, have made a proposition for constructing the road which will probably be accepted. It is agreed that there shall be shops at Fort Scott. Construction is to be begun at Fort Scott and progress in both directions.

Detroit, Hillsdale & Indiana.

This company, it is reported, will soon run trains through between Detroit and Indianapolis, using for that purpose the tracks of five companies.

Union Pacific.

It is now reported that the Pennsylvania party no longer seeks to maintain control of this road, and that Thomas A. Scott will surely retire from the presidency at the next election, and devote himself to the Texas Pacific. It is also reported that the Vanderbilt party is likely to secure control at the March election, and make Horace F. Clark President.

Memphis & Vicksburg.

This company has been receiving proposals for the construction of 55 miles of its line from Vicksburg northward, crossing the Yazoo ten miles from Vicksburg and extending thence along Deer Creek. Twenty-five miles must be completed by September next in order to secure the State subsidy of \$4,000 per mile. The company pledges in payment its first mortgage bonds at the rate of \$16,000 per mile, the State subsidy of \$4,000 per mile, and bonds of Warren County amounting to \$300,000.

Atchison, Topeka & Santa Fe.

The road-bed for the Wichita Branch of this road is substantially completed, and it is intended to have the iron down and trains running early in May, which is about the time the first droves of Texas cattle arrive. Wichita is on the trail to Abilene, the great shipping point on the Kansas Pacific, and the Atchison company counts on intercepting a large portion of the traffic at this point.

Leavenworth Bridge.

Another span was completed on the 13th and the only remaining one is to be in place by the middle of March.

Sunbury & Lewistown.

The Pennsylvania Railroad Company in operating this new railroad joins it with Mifflin & Centre County Railroad, and calls the two together the "Lewistown Division."

Atlantic & Gulf.

At the recent annual meeting of this company in Savannah, a proposition made to extend the road to Mobile met with great favor, but was referred for further details. An offer from Morris Ketchum and others of New York to lease the road was read, and a motion requesting the parties to make a definite offer was adopted. The proposition is to be submitted to the stockholders at a future meeting.

Long Island Railroads.

The New York *Tribune* has the following concerning railroad construction and improvements on Long Island:

"The Long Island Railroad Company is laying a steel rail on its road between Hunter's Point and Winfield. Work on the Rockaway Branch was resumed on the 29th ultimo. The Hempstead Branch of the South Side Railroad has been consolidated with the Bay Ridge road, and the work of completing the latter road will be rapidly pushed forward. The double track of the South Side Railroad will be extended to Babylon, as soon as the weather will permit. The Richmond Hill & Orient Railroad will connect with the South Side Railroad at Richmond Hill, and will pass through the principal villages on the north side of the Island. Agreements have already been signed to transfer passengers and freight from Richmond Hill to Brooklyn. The contract for grading the road to Port Jefferson has been awarded. The Central road advances slowly, owing to the heavy cut at Rocky Hill, where 150 men are engaged night and day. The road will not be in running order before June. The larger portion of the Smithtown & Port Jefferson Branch Railroad has been graded, and the work of laying the iron begun. On the opening of spring, work will be begun on the Whitestone & Rockaway Railroad."

Union Pacific.

A Washington correspondent writes that the President of the Kansas Pacific Railway Company has memorialized Congress for legislation to prohibit the Union Pacific Railroad from discriminating against the Kansas line in its rates for through freight and passengers. The memorial states that the Union Pacific road charges local rates for passengers and freight bound westward which come over the Kansas line to Cheyenne, and, in like manner, eastward-bound freight and passengers going by way of the Kansas road are charged local rates from Ogden to Cheyenne, where they leave the Union Pacific. This prevents the Kansas Pacific from competing for through business to Salt Lake City and the Pacific coast, except at ruinous rates, and gives it nothing to depend upon but the local business arising along its line. The President of the company argues that the act authorizing the construction of the Pacific Railroad contemplated branches starting at different points in Missouri and Iowa and joining the main line west of Omaha, in order that the advantages of the road might be enjoyed to as full an extent as possible by the Government and the people. This argument he supports by extracts from the law. The memorial has been referred to the House Committee on the Pacific Railroads.

Carondelet Bridge.

A bill has been introduced into Congress authorizing the construction of a bridge across the Mississippi at Carondelet, by a corporation of the States of Illinois and Missouri, known as "St. Clair and Carondelet Bridge Company." Section 2 of the bill is as follows:

"That the bridge authorized by the preceding section to be built shall be constructed with continuous or unbroken spans, and subject to the following conditions: First, the spans over the main channel of the river shall not be less than four hundred feet in the clear from pier to pier; secondly, no span over the water at low-water mark shall be less than two hundred feet in the clear of abutments; thirdly, the elevation of said bridge over the main channel shall not be less than fifty feet above high-water mark as understood at the point of location, measuring for such elevation to the lowest part of the bridge or bottom chord; fourthly, the piers of said bridge shall be parallel with the current of the river, as near as practicable."

St. Joseph Bridge.

Gov. Willard P. Hall, the President of the company, has, it is reported, secured sufficient capital in New York to insure the speedy completion of this bridge.

"Midland Construction Company."

Articles of association have been filed in the office of the Secretary of State of Missouri for "The Midland Construction Company," the object set forth being for the purpose of constructing, repairing, furnishing and equipping, in whole or in part, any railroad or railroads within the State or elsewhere. The capital stock shall be \$500,000. The following compose the first Board of Directors, viz.: George M. Ochiltree, of Clark County, Mo.; Samuel M. Young, do.; Rodney R. McCormick, of Rock Island, Ill.; Wm. Irwin, of Henry County, Ill.; and E. Pratt Buell, of Lewis County, Mo.; of whom Wm. Irwin is named as President. The principal office is to be at Canton, Lewis County, Mo.

Railroad Earnings in January.

In addition to the returns published last week, we have now the following:

	1872.	1871.	Increase.	Per Cent.
Indianapolis, Bloomington & Western.....	\$101,076	\$80,246	\$20,830	41
Illinois Central.....	642,466	618,063	24,403	4
Western Union.....	60,397	44,235	16,162	36½
Michigan Central.....	505,586	418,755	86,831	20½

Elk & McKean.

This Pennsylvania company on the first week of the month was offering in the London market \$1,500,000 of its first mortgage 7 per cent. gold bonds at 87. It is constructing from Centerville, Elk County, Pa., nearly due northward through McKean County to the New York line, crossing the Philadelphia & Erie road at St. Mary's. At the State line it is intended, apparently, to connect with the Buffalo, Philadelphia & Washington Railway a few miles south of Olean. This would complete a short route from the bituminous coal mines at

the southern terminus of the road to Buffalo, and another to Rochester. The chief business is expected to be coal transportation. Babcock, Overtown & Co., of New York, have the contract for the construction of the line; 30 miles of the northern division they are required to complete by June, and the remainder by January next.

This will also, in connection with the Philadelphia & Erie, open a new and moderately short route between New York and Buffalo, and Philadelphia and Buffalo, and a favorable route for the transportation of anthracite coal to the latter place, where it is easy to find vessels to carry it to the other lake ports.

New London Northern.

At the annual meeting of this company on the 7th inst. the President, A. N. Ramsdell, said that, in accordance with a vote of the stockholders, passed at a special meeting held December 4, 1871, a contract has been entered into with J. Gregory Smith, Worthington C. Smith and Benjamin P. Cheney (who are trustees and managers of the Vermont Central Company) for the operation of the railroad of this company, for twenty years from December 1, 1871. These parties are to pay to this company \$150,000 a year, in quarterly installments, and in addition, \$15,000 a year for every \$100,000 of gross annual earnings of the road in excess of \$510,000.

The company agree to issue bonds to an aggregate amount of \$500,000, as the same may be needed, for the proper development of the business of the road, and to issue such further amount of bonds as may be mutually agreed upon for the like purpose.

The parties undertaking the operation of the road assume all responsibilities and liabilities incident thereto, and agree to pay the interest upon the bonds to be issued as above mentioned, during the continuance of the contract. Ample provisions are made for the proper use of all property of the company taken by them, and for its return at the expiration of the contract, and for the forfeiture of the contract by them in case of default in making payments as aforesaid.

Pennsylvania Canal Company.

The annual meeting of the stockholders of the Pennsylvania Canal Company was held on the 13th inst., at its office, No. 234 South Third street. The annual report was presented by the Secretary, Mr. A. Mordecai. It shows the net revenue for the year 1871, clear of drawbacks, to have been \$636,354.33 against \$585,084.87 in 1870, showing an increase for 1871 of \$51,269.45. The Treasurer's statement shows the balance on hand January 1, 1871, to have been \$59,472, and the receipts from all sources during the year \$1,006,648.26, making the total receipts \$1,066,120.26. The expenditures were \$1,041,340.91, leaving a balance on hand of \$24,779.35. The company owns a canal from Hollidaysburg to Columbia, 173 miles, leases the West Branch & Susquehanna Canal (a majority of the shares of which it owns) from Juniata Junction to Farrisville, 123 miles, and owns the Wyoming Valley Canal, from Northumberland to Wilkes-barre, 64 miles, thus operating 360 miles of canal.

Location of Stations.

The Senate of West Virginia has passed a bill requiring the railroads of that State to erect station-houses at the nearest points to towns of 500 inhabitants or more.

Philadelphia & New York.

A bill has been introduced into the New Jersey Legislature to incorporate the Philadelphia & New York Railroad. The names of William Parry, John Wilson, John H. Paterson, Thomas N. Adams, John Taylor, Henry T. Bonsill, Adolph Schenck, Jeremiah Cleveland and S. C. Forker, are given as incorporators, with a capital of ten millions, to build a road from some point near Camden to cross the State to some point in Hudson County, with power to run as many tracks as may be necessary, and with power to connect with or lease any other roads, and to connect with New York City steamboats. When the proceeds of the said road shall amount to 7 per cent., they have to pay the State the sum of one-half of one per cent., and be subject to no other tax. The said road to be commenced within three years and finished within ten.

Boston, Hartford & Erie.

This company was adjudicated an involuntary bankrupt, first in Massachusetts, then in Connecticut, and finally in New York. The assignee in bankruptcy in Massachusetts was accepted as the assignee by the Connecticut creditors, but the New York creditors had a different assignee. Judge Blatchford had made the adjudication in New York, and an appeal was taken to the Circuit Court. Judge Woodruff has now reversed the adjudication of Judge Blatchford, on the grounds that after the adjudication in Connecticut, where a single assignee had been agreed upon and complete jurisdiction established, any adjudication in New York was unnecessary and superfluous, and would only tend to complicate matters with which the Court of that district was estopped from interfering.

Petersburg & Weldon.

The 4,755 shares of this company held by the city of Petersburg were sold on the 2d instant to Reuben Ragland, who is supposed to have purchased for the Southern Railway Security Company. The price was \$85 per share. Ragland is to pay in cash \$154,675, on the delivery of 1,255 shares, to vote and draw dividends on all; to give his bond for \$249,525, payable on August 1, 1875, to bear six per cent. per annum interest, payable semi-annually, in February and August, secured by 8,500 shares of stock; the stock undelivered to be paid for at any time the city is ready to deliver, or four months' notice afforded him, interest to continue until payment is made.

Atlantic & Pacific.

Mr. L. Kellett, Engineer in charge of the surveys for the St. Louis & Mexican Gulf Branch of the Atlantic & Pacific Railroad, has selected Sabine Pass as the Gulf terminus of that line. This is on the Texas side of the outlet of Sabine Lake, about sixty miles northeast of Galveston. There is usually seven to ten feet of water on the bar, but the mud below is very soft.

Wheeling & Lake Erie.

A contract for the construction and equipment of this proposed railroad has been made, conditional on securing certain local subscriptions.

St. Louis & Iron Mountain.

This company in the course of its business sends its loaded cars over Southern lines which connect with it, but doesn't always find it easy to get them back, especially at such a time as this, when the Southern lines are crowded with freight far beyond the capacity of their rolling stock. At this time it is reported that these roads owe the Iron Mountain 2,500,000 miles excess of car mileage. The company has recently added 200 cars to its stock and has contracted for 350 more.

Kansas Central.

The Leavenworth *Commercial* sums up the condition of this road as follows:

"The company has been organized, the line located sixty miles—to Holton—the right of way secured, the grading and bridging about completed for the first section of ten miles notwithstanding a most unprecedented cold winter, the ties, iron, cars and engines on the ground, and an agent of the company in Europe for money to build it to the Rocky Mountains."

THE SCRAP HEAP.**Railroad Patents.**

For the week ending February — the United States Patent Office granted the following patents:

Lock safety-valve for steam boilers, to Henry G. Ashton, East Cambridge, Mass.

Railroad car, to William Bell, Perth Amboy, N. J., who claims: 1. A removable car body, with inclined sides, arranged and combined with the platform of the car, adapted to receive and hold it. 2. Supports on the platform on the corners for retaining the said body in position.

Sash-holder for car windows and blinds, to Charles P. Mixer, Worcester, Mass. He claims "A sash-holder composed of a metallic plate provided with sockets and depressions in combination with a screw and springs, said parts being constructed and arranged for joint operation."

Railroad-car brake, to G. H. Merriam, Portland, Me., who claims: 1. The combination of a shaft arranged above the trucks with pulleys and chains arranged to bring the line of draught horizontal with the brake-head, and jointed rods or chains attached by an adjustable connection to the brake bars. 2. The combination of the different sections of the rocking shaft with the removable slotted links or plates.

Locomotive for ascending inclined planes, to Nicolas Riggensbach, Olton, canton of Solothurn, Switzerland, who claims: 1. Continuous supporting rails and an elevated rack rail in combination with a climber or cogged driving-wheel, and with flanged supporting wheels, which latter are constantly on the track, and are made to serve as drivers or not, as required, by a suitable clutch mechanism. 2. A climber and spur wheels fixed on a shaft, independent of the main driving or carrying wheels, in combination with a steam driven crank-shaft and pinions for driving the said shaft. 3. The combination of the crank axle, sleeve axle, drawing wheels and clutches. 4. An adjustable extension of the rack rail, in combination with the climber, for the purpose of guiding the said climber into gear. 5. The combination with the climber of a brake arrangement.

Car wheel, to Solomon P. Smith, Troy, N. Y., who claims: 1. A packing for elastic car wheels, consisting of two independent elastic rings compressed on two inclined faces of the rim of the wheel. 2. The combination of the sectional body, a tire having an internal rib, intervening elastic packing material, and bolts which extend through both sections and through the rib.

Car wheel, to Solomon P. Smith, Troy, N. Y., who claims: 1. The introduction of a compressed annular elastic packing between cylindrical faces of the body and rim of an elastic car wheel by first compressing the packing on the periphery of the body, and then adjusting the rim upon the latter. 2. The combination of the sectional body and a tire having an internal rib extending between said sections, and having an elastic packing at each side. 3. The rim, having an internal rib, enlarged at or toward its inner edge. 4. The combination of the fastening devices confining the plates or sections and a compressed packing.

Brake shoes, to John S. Whitworth, Norfolk, Va.

Dr. Lamoth's Iron Car.

We are requested to state what we should have said in the description of this car which we gave last week, that it is now, and has been for more than two months, running on the New York & New Haven road, and can be seen there by persons interested in it.

Accidents in Great Britain.

From recent parliamentary returns it appears that whereas the number of deaths from street accidents during the last two years has been 2,997, those resulting from railway accidents have been only 606, so that it would appear that street traveling is nearly five times more dangerous than traveling by railway is. In the same period 2,122 lives were lost in mines, 515 in factories, and 14,463 by ordinary casualties on land. In that country, therefore, the chances are 33 to 1 that the accident which kills you will not be a railroad accident.

Narrow-Gauge Convention.

It is proposed to hold a convention of persons interested in narrow-gauge railroads in St. Louis next June. What is to be discussed is not stated, whether the general question, or the propriety of adopting a uniform standard gauge for roads of the kind in this country.

"Red Oil."

A green hand who had just commenced running as fireman went into the oil-room one day, swinging his red lamp, and asked for some "red oil." He is known as "Red Oil" now.